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PHYSIOLOGICAL STUDIES IN EXPERIMENTAL ASPHYXIA AND DROWNING*

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THE experiments which were reported from this laboratory[1] in a preliminary study of the mechanisms involved in experimental drowning have been continued and extended. The purpose of the present paper is to report in greater detail the results of this investigation.

I. ANALYSIS OF NORMAL DROWNING PROCESS

An endeavour was made to reproduce, as closely as possible, conditions which occur in actual drowning. In some cases, where electrocardiographic records, blood samples and kymographic records were essential, drowning was produced by filling a specially designed tight fitting face-piece with water from an elevated water bottle. This water was coloured with a harmless dye so that the aspirated or swallowed fluid could be readily detected at autopsy. In other experiments the animals were placed in a large, covered, water-filled tank. Observations were made through a glass window.

When the water was in contact with the nasal and laryngeal regions the animal held its breath and struggled for about 1½ minutes. This forced apnœa was followed by a series of gasps during which water could be heard entering the lungs or stomach. The struggles in this period were spasmodic, occurring about once every 10 seconds, and resembled tetanic convulsions. Violent vomiting usually occurred after 3 minutes or so. This was merely a reflex emptying of the stomach which had been distended by swallowing large quantities of the water. Within 5 minutes all movements ceased and no further signs of life were evident.

Kymographic records, including blood-pressure and respiratory tracings, showed that the blood-pressure rose to 250 to 300 mm. Hg. during the initial struggling and fell slightly during the succeeding period of apnœa. Following this period of apnœa, when gasping was evident, the blood-pressure levelled off at about 100 mm. Hg. but the pulse pressure showed a very marked increase. This period of increased pulse pressure coincided with a rapid decrease in heart rate and a tremendous fall in the arterial blood O_2 content to about 2 volumes per cent. The bradycardia followed an initial acceleration coincident with the struggling phase, the heart assuming its idioventricular rate. In electrocardiographic records it was evident that an A-V block was present, the ventricular complexes being slow and regular. This was presumably due to anoxæmia.

Invariably a typical asphyxial reaction was noted about 2 minutes after the onset of apnœa. The asphyxia was of short duration and was indicated by a sudden increase in heart rate (Graph 1) and a slight rise in blood-pressure. Following this response the blood-pressure fell rapidly to zero; the heart sometimes went into fibrillation. In cases where fibrillation did not supervene, slow ventricular complexes could be recorded for as long as 25 minutes, although cardiac activity was recorded in one case for over one hour. These post-asphyxial beats were probably non-expulsive.

The arterial blood CO_2 content showed an initial increase during the struggling phase. This was probably due to the increased production of CO_2 from the increased muscular activity. As the animal ceased to struggle the CO_2 content decreased. This progressive decrease continued throughout the whole asphyxial state (Graph 2). Theoretically, an increase in the CO_2 content due to CO_2 accumulation in the absence of alveolar exchange would be expected. However, in some 24 such experiments a pro-

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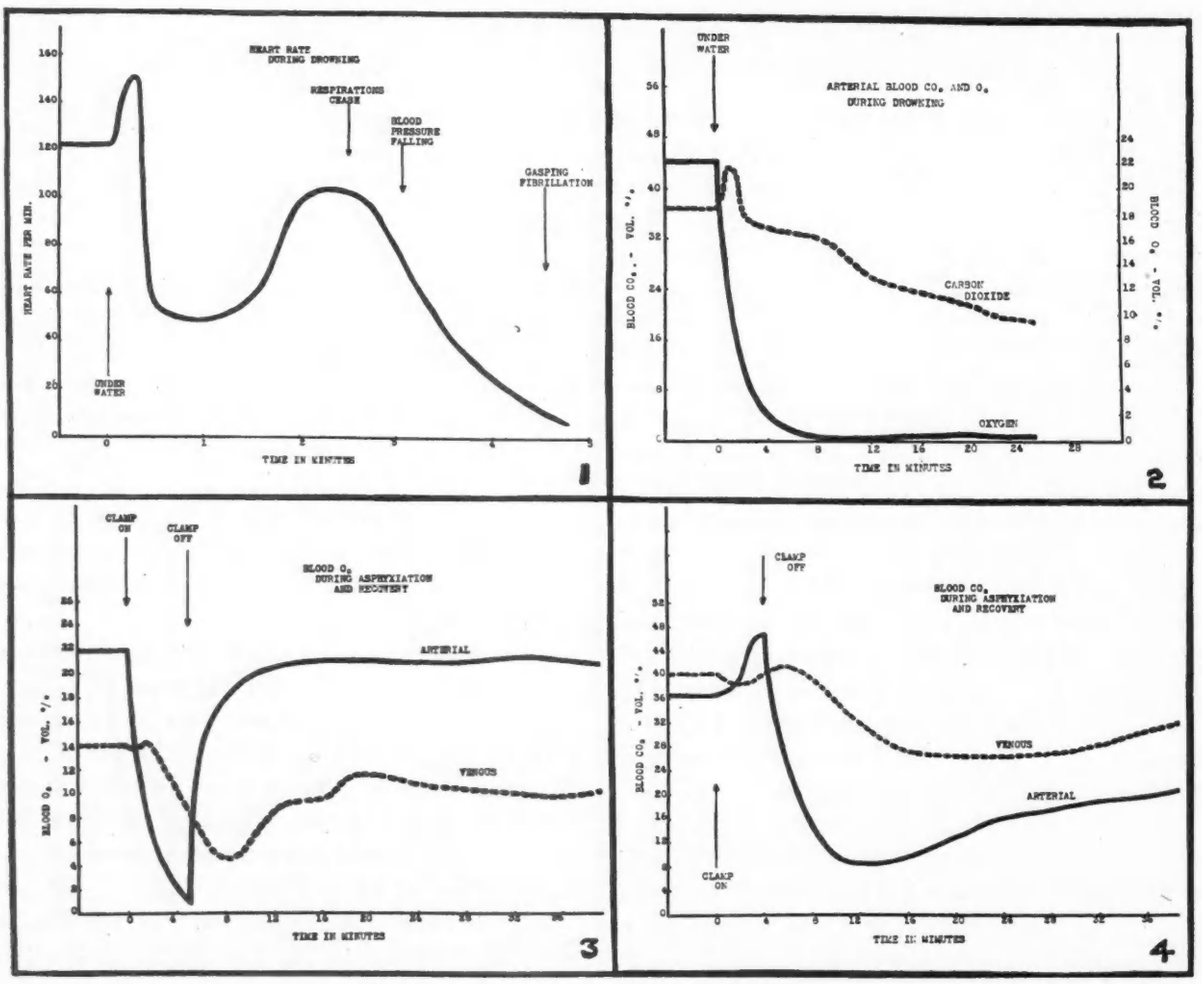
gressive decrease in the CO_2 content was found.

At autopsy the whole bronchial system was usually found to be filled with a frothy fluid which was considered to be a mixture of aspirated water, œdema fluid and alveolar gas. Many large congested-looking areas were seen on the surface of the lungs. The lungs were crepitant and, in a large percentage of cases, floated on water. Foamy fluid exuded from the cut surface. In some cases no fluid was found in the lungs, suggesting that a spasm of the larynx had prevented the passage of water into the bronchial tree. Large quantities of water were found in the stomach of these animals where artificial respiration, vomiting, etc., had not previously effected its removal. In all cases the right heart and great veins were engorged with blood, the left heart being contracted and empty.

II. Experiments to Demonstrate Reflex Spasm of the Larynx

In a considerable number of undeniably drowned persons no water has been found in the lungs at autopsy. This same finding was observed in some of the drowned animals described in the preceding section. It seemed, therefore, reasonable to suppose that the water was prevented from entering the lungs by a spasm or closure of the larynx. Further evidence to support this contention was derived from the fact that large quantities of water are frequently found in the stomachs of drowned persons, as they were also in the stomachs of our experimental animals. On this assumption experiments were carried out in order to demonstrate such a reflex mechanism.

When the animals were subjected to drowning conditions by means of the water mask



Graph 1.—Showing the changes in heart rate during drowning. **Graph 2.**—Showing changes in blood CO_2 and O_2 occurring in experimental drowning. **Graph 3.**—To show variations in blood O_2 content during asphyxiation and recovery. **Graph 4.**—Showing changes in blood CO_2 content during asphyxiation and recovery.

described above they either swallowed or aspirated the water. When water was introduced into the pharynx by this means reflex swallowing took place. This occurred in both conscious and lightly anæsthetized animals. In deeply anæsthetized animals swallowing and aspiration of the water proceeded on a reciprocal basis. When the degree of anoxæmia attained a certain magnitude the resulting air-hunger gasps might or might not cause relaxation of the larynx. Similarly, when the distension of the stomach had reached a certain degree reflex emptying of this organ occurred. It was noticed frequently, either before or after vomiting, that only a single inspiratory effort occurred. This suggested that aspirated water, reaching the trachea, caused reflex closure of the glottis.

In order to study in more detail the reflex involvement of the larynx and pharynx in the drowning process, the following series of experiments were performed. Under local anæsthesia the œsophagus and trachea were divided low in the neck. Cannulæ were inserted into each end of each structure. By means of this procedure the animal was able to continue independent breathing through the open end of the cut trachea. Similarly, the animal was able to swallow, but instead of the swallowed material passing into the stomach it was collected through the open end of the cut œsophagus. When the animal at this time was subjected to drowning conditions the water in the mouth could either flow through the upper part of the severed trachea or could be swallowed and collected from the open end of the cut œsophagus. In most cases, as soon as the water reached the pharynx the normal swallowing reflex took place. At this time, of course, the glottis was closed. Since the animal, in the above experimental condition, could swallow water indefinitely, the glottis remained closed. In other animals a constant volume of water, about 10 c.c., was collected from the cut trachea, at which time the glottis closed and swallowing commenced.

When the upper end of the cut œsophagus was clamped the animal was no longer able to swallow, and the glottis opened temporarily, allowing some 10 c.c. of water to go into the trachea. This immediately produced a closure of the glottis again and no more water passed through. When the two ends of the œsophagus were joined, allowing the swallowed water to pass into the stomach, swallowing proceeded until the stomach was filled. When the intragastric pressure apparently reached a certain height, vomiting commenced and reflex emptying of the stomach took place. This latter phenomenon was also observed when water was poured into the lower end of the œsophagus. In some animals it was noted that under certain conditions this reflex closure of the glottis might undergo accommodation.

We have shown, under the conditions of these experiments, that when water is introduced into the pharynx and larynx a small quantity may pass into the trachea. This immediately causes a reflex closure of the glottis. In an endeavour to get rid of the water swallowing takes place and usually continues until the stomach is distended. Vomiting then usually takes place in an effort to rid the stomach of this water. The glottis usually opens again and more water is aspirated.

In the intact animal, as indicated in the first section, this sequence may also take place. On the other hand, the animal may simply hold its breath and die of asphyxiation. The animal may also aspirate large quantities of water, swallow little, if any, and die of asphyxia.

III. EXPERIMENTAL ASPHYXIA

In order to correlate these results with the findings in experimental asphyxia produced by means other than drowning another series of experiments were conducted. The most rapid and effective method of producing asphyxia is by clamping the trachea. The changes in arterial and venous blood CO_2 and O_2 content, blood-pressures, heart rates and electrocardiograms were studied in a series of 15 animals during experimental asphyxiation.

It is necessary at this point to mention that the hæmoglobin content of animal blood is higher than that of human blood. Consequently, the normal arterial blood O_2 content is usually about 25 volumes per cent, while the venous blood O_2 content is about 16 volumes per cent. The CO_2 content of both arterial and venous blood is lower than in human blood, the arterial being about 30 to 35 volumes per cent and the venous 38 to 40 volumes per cent.

At the onset of asphyxiation the arterial blood O_2 decreased rapidly and was followed by a less rapid fall in venous O_2. Initially both

the arterial and venous CO_2 rose fairly rapidly, to reach a peak in about 3 minutes, after which a fairly sharp decrease occurs. These blood gas changes, produced by simply clamping the trachea are practically identical, both in their time relationship and in their magnitude, with the changes observed in experimental drowning. Similarities were also observed in blood-pressure, heart rate and electrocardiographic records of the animals dying of acute asphyxia and those subjected to fatal experimental drowning.

When partial asphyxia was produced by temporary clamping of the trachea the initial asphyxial changes were followed by recovery. Recovery was prompt, a marked increase in the arterial and venous O_2 being observed (Graph 3). The blood CO_2, however, showed a rapid decrease from the asphyxial peak to extremely low plateau (arterial 16 volumes per cent, venous 24 volumes per cent) (Graph 4). This acarbia was probably due to the tremendous hyperpnœa which occurred.

Asphyxia may be maintained for only a comparatively short period of time if recovery is to take place. This time varied with the individual animal but rarely exceeded 4 minutes; in some animals recovery has occurred after the trachea had been clamped for 7 minutes, while other animals failed to recover after temporary asphyxia of 2 minutes' duration. Another interesting feature was observed in the time-interval between the cessation of respiratory efforts during asphyxia and the cessation of expulsive cardiac beats. This interval varied only from 11 to 17 seconds. If the asphyxia was maintained 4 or 5 seconds longer resuscitation was of no avail.

Other experiments were carried out in which repeated periods of asphyxia were produced. It was found that in these animals the blood gas response to each successive period of asphyxia was the same as in the initial period but that the CO_2 response occurred at a progressively lower level. In another group of animals the trachea was clamped for 55 seconds of each minute and released for 5 seconds. This intermittent asphyxia was continued for a period of 30 minutes without fatal effects. These experiments might conceivably simulate certain types of drowning accidents where the periods of total submersion are interrupted by struggling which brings the person to the surface of the water.

IV. Therapeutic Measures used in an Endeavour to Influence Recovery from Asphyxia

Experiments have been carried out, in a manner similar to those described in the preceding section, in order to determine the effect of therapeutic measures in the recovery from asphyxia.

1. *Artificial respiration.*—Asphyxia was maintained by clamping the trachea for varying periods of time. As noted in the previous section, the periods of asphyxia after which recovery would take place depended upon the critical interval after the cessation of respiratory efforts (11 to 17 seconds). If the asphyxia was relieved during this short period spontaneous recovery took place in the great majority of cases. If, however, the asphyxia was maintained for slightly longer periods of time (even a few seconds) spontaneous recovery did not take place. In this period, where spontaneous recovery would not occur, artificial respiration if instituted immediately practically always resulted in successful recovery. The longer the period of asphyxia the longer artificial respiration had to be maintained. It must be emphasized, however, that successful artificial respiration was possible only when started within a few seconds after the time when spontaneous recovery could take place. Precisely the same criterion had to be applied in the cases where asphyxia was produced by experimental drowning.

2. *Venesection.*—In view of the tremendous engorgement of the right heart and great vessels it seemed reasonable to determine the effect on the recovery process following asphyxia by removing some of this venous blood. As much as 100 c.c. of blood was removed from animals in the asphyxial stage at the time when the blood pressure was almost zero. Electrocardiograms, which were taken simultaneously, indicated an initial improvement in the heart action. However, there was no increase in the blood-pressure, possibly due either to a constriction in the pulmonary bed preventing blood reaching the arterial system or to the decreased functional ability of the heart at this time. Transfusing venous blood directly into the arterial system did not prove effective.

3. *CO_2 insufflation.*—In all cases of asphyxia, whether produced by drowning or by clamping

the trachea, a marked acarbia was observed. In an attempt to correct this low blood CO_2 the effects of insufflation of this gas were studied.

A tank of CO_2 gas was connected to the animal by reducing valves, so that periodic inflation of the lungs could be produced. High concentrations of CO_2 alone were ineffective. Lower concentrations of CO_2 (15 per cent) combined with artificial respiration were more effective than artificial respiration alone. Carbogen (5 per cent CO_2, 95 per cent O_2), in association with artificial respiration, was the most effective gas mixture tested. In these two instances the blood CO_2 returned to normal much more rapidly (in about ½ the time) than when artificial respiration alone was applied. The animals were also in much better condition following restoration of breathing when carbogen was used.

4. *Drug therapy.* — The usual cardiac and respiratory stimulants, adrenaline, ephedrine, coramine, cardiazol, etc., were used in an endeavour to re-establish circulation and respiration in those cases where the asphyxia was prolonged beyond the stage where spontaneous recovery could take place. In our experience none of these drugs was effective. In contradiction to the statement in our preliminary report[1] regarding the use of adrenaline we now feel that it is not desirable to use adrenaline in these cases. This has become evident after seeing a certain number of animals used in the experimental drowning series exhibit fatal ventricular fibrillation. Nicotine, used in small doses as a sympathetic stimulant, likewise was ineffective in aiding recovery. Atropine, if given prior to the asphyxia, increased the length of time during which expulsive heart beats occurred. Given at times comparable to the periods when the heart stimulants were given no effects were noted. This, of course, is due to the fact that atropine requires some minutes before it is effective. Amyl nitrite was used in conjunction with artificial respiration during the late asphyxial period with considerable success. It was possible to resuscitate animals treated in this way when all other measures would have been ineffective, as proved by control experiments.

Further experiments using cocaine in an attempt to relieve the laryngeal spasm, as found in many of the drowning experiments, proved that this drug was ineffective in relieving such spasm.

5. *Tracheal catheter in drowning experiments.* —In many cases of experimental drowning it was impossible with artificial respiration to obtain an adequate exchange of air into and out of the lungs. This was due to the laryngeal spasm, which was discussed in the first section of this paper. By introducing a semi-rigid catheter (Porges) through the closed glottis artificial respiration then became effective and adequate ventilation was assured.

SUMMARY

From the experimental results presented in this paper certain resuscitative measures may be recommended as a basis for the treatment of apparently drowned persons. The same measures may be of value in the treatment of patients suffering from other acute asphyxial conditions.

As mentioned previously,[1] all foreign matter should be removed from the mouth, larynx and pharynx. In the cases of drowning the body should be gently lifted up by the waist, to allow as much water as possible to drain from the stomach and lungs. The body should then be placed in the prone position with the head and chest lower than the rest of the body, if at all possible. With the head of the patient slightly retracted and lying on one side, the Schäfer method of artificial respiration should be started immediately. The necessity for prompt artificial respiration has been adequately demonstrated in our experiments.

It is of vital importance that there should be a free passage of air into and out of the chest. To facilitate this the tongue should be pulled forwards, and if the passage of air cannot be heard the introduction of a tracheal catheter is almost essential. When the catheter has been passed initial suction on this tube should remove much of the foam filling the trachea and bronchi.

Insufflation of the lungs with carbogen (5 per cent CO_2 and 95 per cent O_2) has been found to be very valuable in association with artificial respiration in experimental asphyxia. This procedure might be used to advantage in drowning cases. The gas mixture can be passed into the lungs through the tracheal catheter, the excess air on forced expiration readily escaping through the glottis around the catheter.

Even without special apparatus a "perle" of amyl nitrite may be crushed and held over the open end of the tracheal catheter during the inspiratory phase of the artificial respiration. After two or three "whiffs" of amyl nitrite the administration of carbogen may be recommenced at a rate of about 3 litres per minute.

As a result of our experiments we consider that prompt, adequate and prolonged artificial respiration is the fundamental treatment for drowned, asphyxiated, or electrocuted persons. In the case of drowning the additional procedures as outlined above are recommended for the reasons stated.

The authors wish to express their thanks to Sir Frederick Banting and G. W. Manning for their assistance in certain phases of this investigation, and to the Committee on Resuscitation, under Mr. Wills Maclachlan and Dr. Gordon Bates, for their continued interest in this problem.

REFERENCES

1. BANTING, F. G., HALL, G. E., JANES, J. M., LEIBEL, B. AND LOUGHEED, D. W.: Physiological studies in experimental drowning, *Canad. M. Ass. J.*, 1938, 39: 226.
2. JANES, J. M.: New facts on resuscitation of the apparently drowned, *Ont. Med. Ass. Bull.*, 1938.

COMMON CONDITIONS OF THE NECK OF THE FEMALE BLADDER AND URETHRA*

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THE purpose of this communication is to discuss a symptom-complex affecting so many women that you who are in general practice must hear of it daily. We refer to the frequency of urination accompanied by varying degrees of dysuria, urgency, urethral pain, hæmaturia, and frequently incontinence of urine. The condition is often characterized by the patient as "bladder trouble". The story of most of these sufferers is usually a long one. In a great many cases we have failed to recognize the true condition because we have not paid sufficient attention to that portion of the female urinary tract which developmentally comes from the Wolffian duct; in short, the trigone of the bladder, the urethra and the glands in relation to it. For this reason it is intended to confine the discussion to those causes found in the vesical outlet and urethra of the female.

The *common surgical conditions* of this region in the female may be said to be: (1) trigonitis; (2) trigonitis cystica; (3) trigonitis pseudomembranosa; (4) urethritis, chronic inflammatory, non-specific; (5) urethritis cystica; (6) stricture of urethra; (7) caruncle of the urethra; (8) relaxation of the urethral sphincter, causing incontinence; (9) urinary fistula.

PATHOLOGY OF THE VESICAL NECK AND URETHRA OF THE FEMALE

As will be shown, the pathology of the bladder neck and urethra of the female is comparatively simple and the lesions are limited in variety. What is often forgotten is that pathological conditions so frequently exist in these structures. Among the first to call attention to such pathological changes as the cause of urinary symptoms in women were Bugbee,[1] Judd,[2] Pugh,[3] Stevens,[4] and Folsom.[5] Indeed, it was Folsom who several years ago communicated to us some of his enthusiasm for this subject. In order therefore to correlate the clinical with the pathological picture, a histopathological study of the female bladder neck and urethra was undertaken by a member of our staff, Sydney Beck.[6]

Our study comprises 50 post-mortem specimens, 30 from adults 40 years of age and older, 17 from children 4 years of age and younger, and 3 at 10, 13, and 20 years of age respectively. The sections were cut longitudinally to include all the urethra and as much of the trigone as possible. Five of the children's specimens were serially sectioned. In order to obtain a true perspective of our findings we considered it necessary to study the structures in the young child and compare them with those of the adult, for several reasons—because the adult specimens differed greatly one from the other; because in the adult specimens there was much evidence of an inflammatory reaction; and because we considered the children's specimens as normal. We shall first show the normal histopathology of the vesical neck and urethra of the female child, and then indicate the changes that occur in the adult female urethra.

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In the child two types of vesical neck and urethra were found. In the first and most frequently found normal type the mucosa was smooth and without any invagination or peri-mucosal structures about the bladder neck or urethra (Fig. 1). The second normal type showed a urethra with mucosal invaginations, which are sometimes quite numerous. These are most strikingly seen in that portion of the urethra adjacent to the vesical orifice, and are exaggerated by relaxation of the structures (Fig. 2). It is now known that there are six mucosal folds in the urethra, two on each lateral surface and one each on the dorsal and ventral surface. When cut tangentially these structures may add confusion to the interpretation (Fig. 3). In the anterior third of the urethra, occasionally in the middle third, peri-urethral tubular structures distinct from Skene's glands are seen. These structures were not seen in the third of the urethra adjacent to the bladder. Skene's glands are always para-urethral (Fig. 4).

We have found *within* the epithelial lining of the bladder neck, of the urethra, of the urethral crypts and invaginations, and of Skene's ducts, glandular cells surrounding a small lumen, manifesting a definite secretory appearance, and being quite distinct from the surrounding transitional cells. These collections of glandular cells are called by Maximow and Bloom "intra-epithelial glands", and they do not cause the epithelium to bulge into the canal, nor do they cause the basement membrane to project into the connective tissue.

To summarize our findings in the so-called "normal" specimens of the bladder and urethra of children:—

1. We have ridges, folds, and invaginations which may be mistaken for gland structure in a relaxed mucosa.
2. True peri-urethral glands do not exist in the one-third of the urethra adjacent to the bladder.
3. Simple peri-urethral tubular epithelial structures appear in the anterior two-thirds of the urethra adjacent to the compound racemose glands of Skene, but distinct from the latter.
4. Glandular structures are found within the mucosal epithelial lining of the bladder neck, the urethra and Skene's ducts, and are called "intra-epithelial glands".
5. Skene's glands are always para-urethral glands whose ducts empty on the floor of the urethra.

We have purposely dwelt at length on our findings in the specimens from children because they emphasize the simplicity of the histopathology of the structures. Now wherein does the adult differ from the child? The most striking and almost universal difference was the evidence of submucosal infection as shown by round-cell infiltration: 28 of the 30 adult specimens gave evidence of such infiltration, and in 24 of these 28 cases additional evidence of inflammation was present other than the round-cell infiltration. Only 4 of the children's specimens showed round-cell infiltration. Proliferation of the surface epithelium in terms of cell-nests and cell-buds (von Brunn cell nests) was present in 16 of the 30 adult specimens. This was seen but twice in the specimens from children. Further, 11 of the 30 cases showed cyst-formation in the posterior urethra or bladder neck. It is our contention that it is the inflammatory process in the submucosa with the consequent production of submucosal fibrous tissue which causes irregularity of the mucosa of the bladder neck in the adult; which causes the intra-epithelial structures to become enlarged and the subepithelial cell-nests to be pushed further beneath the surface mucosa, become vacuolated and finally cystic; and these changes have been most often noted at the urethro-vesical junction (Figs. 8 to 18).

The inciting factors initiating these changes are trauma and infection, both of low grade and often repeated, the trauma of sexual cohabitation and childbearing, and infection induced by those organisms which are more or less continuously present about the external genital organs of the adult female.

Clinical Features

The symptoms are often out of proportion to the pathological changes, but they are nevertheless real. The patients are of any adult age, but usually are women who have had one or more pregnancies, and frequently are in middle life or older.

The attack begins usually with an increased frequency of urination, which may become so marked that the patient passes small amounts of urine every few minutes, with much pain during urination, and often with increased pain at the end of the act. She has a sensation of having incompletely emptied the bladder. Not infrequently there is tenesmus and strangury at the end of urination, and a terminal hæmaturia may occur. Practically always in these circumstances a careful history will bring out the fact that the attack was preceded by exposure to cold or draft, chilling, getting the feet wet, etc. At other times the symptoms are not so acute. The pa-

tient may complain of a vague, indefinite pain or discomfort in the urethra or in the external genitalia, or low down in the back or deep in the pelvis, or sometimes it is referred to the loin. And this may be accompanied by some increased frequency and a mild dysuria. The attacks of urethral and vesical irritation are not continuous; there are periods of remission and exacerbation, and they vary in intensity. A striking thing is that the attacks have recurred over a long period of time, for years in most cases, frequently beginning after the birth of the first child.

THE PHYSICAL FINDINGS

Unfortunately, except for urethral caruncle, physical inspection and even palpation of the female urethra often give no clue to the lesions within it. Usually there is no urethral discharge as in specific urethral infection, and palpation reveals no infiltrations. Exploration of the urethra with a soft rubber catheter may furnish

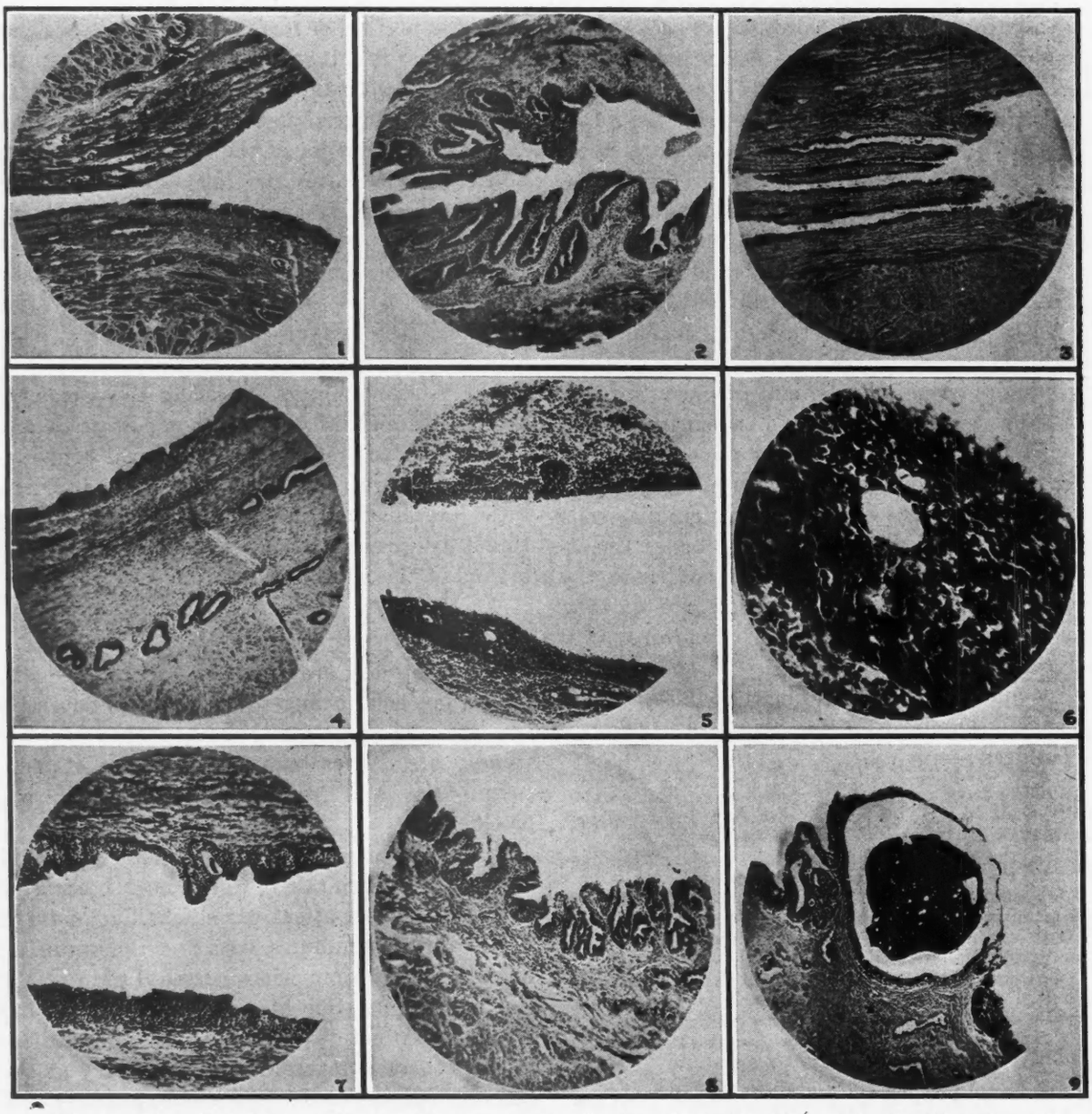

Fig. 1.—Normal bladder neck and adjacent urethra in 5 weeks' old child. **Fig. 2.**—Normal urethra with extreme mucosal invaginations in 19 months' old child. **Fig. 3.**—Two large lateral longitudinal folds in the urethra of a child. **Fig. 4.**—Peri-urethral tubular structures in mid-portion of urethra of a 19 months' old child. **Fig. 5.**—A round-cell infiltration surrounding a proliferation of epithelial cells or von Brunn cell-bud, and intra-epithelial vacuoles in a child 4 years old. **Fig. 6.**—Intra-epithelial gland and vacuole in a 5 years' old child. **Fig. 7.**—Enlarged intra-epithelial structure in 7 months' old child. **Fig. 8.**—Sub-epithelial proliferation of connective tissue causing irregularity of mucosa of bladder neck in an adult **Fig. 9.**—Superficial cyst at urethro-vesical junction with an adjacent intra-epithelial vacuole. X45.

no information as to the real condition. Urinalysis frequently does not reveal cellular change, especially if the bladder itself and the upper urinary tract are not involved, because the urethral lesion is really beneath the mucosa or actually within it. However, exploration of the urethra with a urethral sound, or better still a bougie-à-boule, size F 26, gives invaluable information. With the olivary bougie infiltrations of the urethral wall not detectable by means of the catheter or sound can be made out. Nearly always the use of one or both of these instruments will reveal a tight, generally contracted urethra, or one showing constriction at various points along its course. The most common sites of stricture of the female urethra are at the meatus and the outer third of the structure. The calibre of the normal female urethra is said to be F 28 to F 30. Experience has taught that a urethra that bleeds easily after the gentle and careful introduction of these instruments is most likely the seat of pathological changes.

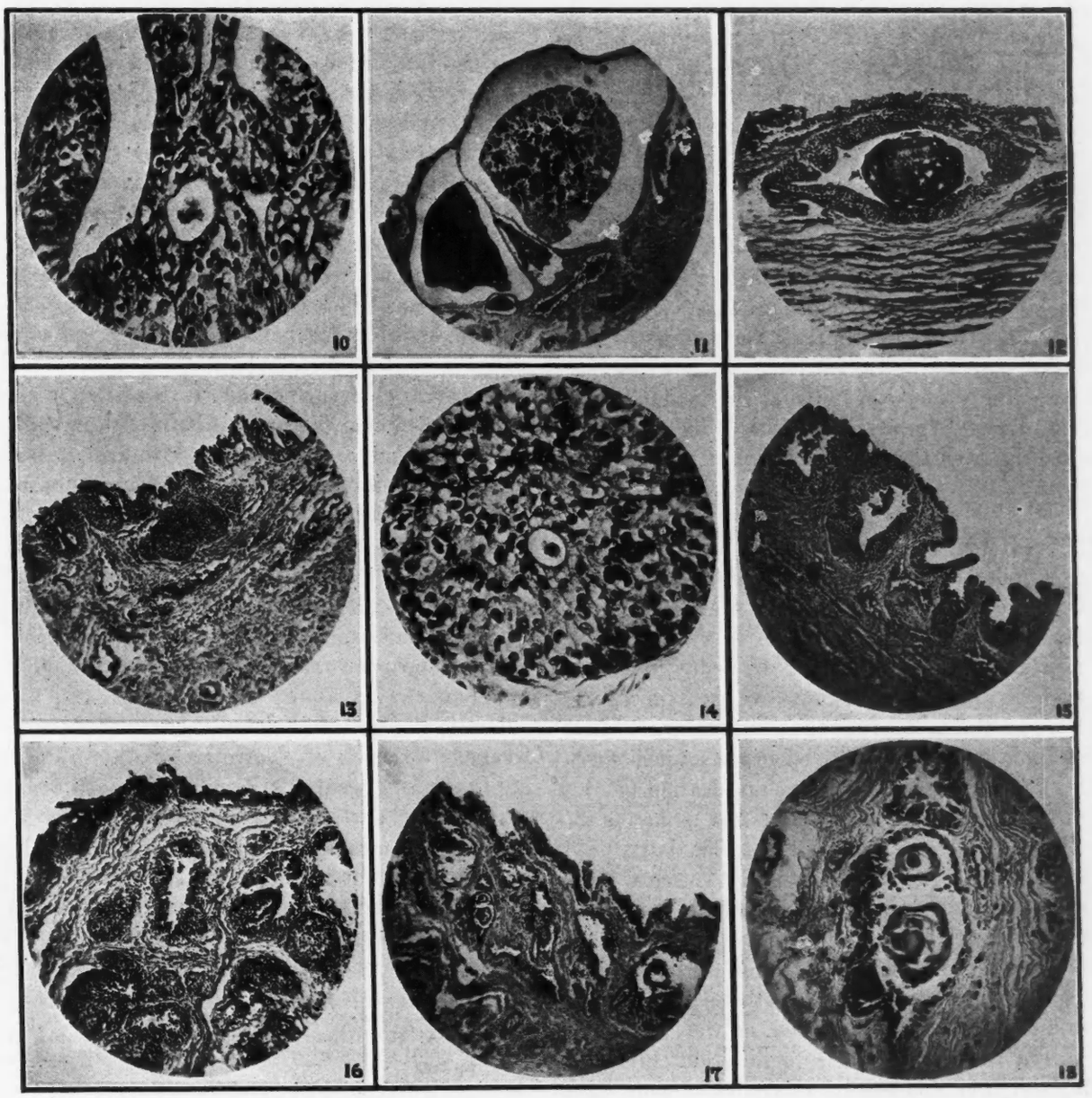

Fig. 10.—The intra-epithelial structure of Fig. 9. X350. **Fig. 11.**—Multiple cysts at urethro-vesical neck. X25. **Fig. 12.**—Sub-epithelial structures in mid-urethra. X70. **Fig. 13.**—Isolated sub-epithelial cell nests. X45. **Fig. 14.**—The sub-epithelial cell nests of Fig. 13. X400. **Fig. 15.**—The intra-epithelial structures increase in size. X45. **Fig. 16.**—Epithelial cell nests deeply embedded at urethro-vesical junction. X60. **Fig. 17.**—Multiple laminated enclosures in sub-epithelial structures adjacent to bladder. **Fig. 18.**—Laminated structure of Fig. 17.

DIAGNOSIS

The diagnosis must ultimately be made by means of the cystoscope or the urethroscope, during the use of which the bladder neck and posterior urethra must be carefully scrutinized. As mentioned above, the urethra in these cases is nearly always tight and contracted. In every cystoscopic examination of the female subject this very fact should lead to a careful visualization of the trigone and the urethra.

The endoscopic picture. — The pathological change to be seen varies from a congestion of the mucosa, an intense engorgement of the mucosa during the early stage, or granulations over the posterior urethra and trigone, to marked rugation of the mucosa, cyst-formation, papilliferous, pedunculated, and sometimes sessile masses of varying size and shape and in all stages of inflammatory reaction. At times the trigone may be the seat of a pearly or cloud-like appearance of the mucosa, with creeping, irregular, serrated, semi-detached edge—the so-called trigonitis pseudomembranosa.

In the anterior urethra the most common lesion observed is the caruncle. It is a vascular, exceedingly tender, sessile or pedunculated granuloma. Its origin is usually infective, frequently from the anterior urethra.

TREATMENT

Treatment of course depends upon the condition found. If the symptoms indicate that the lesions of the vesical outlet and urethra are of an acute nature it is wise to carry out those measures usually employed in acute inflammation of the tract. These are as follows, (1) Forcing fluids in order to make the urine bland and non-irritating and to effect mechanical washing of the passage. (2) The application of heat in the form of hot vaginal douches, as hot as the patient can comfortably stand twice daily. (3) For the painful urination and tenesmus often complained of opium and belladonna suppositories, either rectally or vaginally, as often as necessary. (4) Local bladder irrigation by means of a small soft rubber catheter, using warm saline, warm boracic solution, or warm distilled water, followed by the instillation into the bladder neck and posterior urethra of some form of organic silver solution, such as silvol 2.5 per cent, neo-silvol 5 per cent. This may be done once or twice daily. (5) If the urine is concentrated, highly acid, some alkaline mixture may be given by mouth. A convenient form is citrocarbonate, 1 drachm in a full glass of water every hour the patient is awake. If cultural growth of the urine shows some form of coliform organism present the administration of mandelic acid often gives rapid and startling relief.

Other than as described above, intra-urethral measures, either for diagnosis or treatment, are usually inadvisable until the acute phase has passed, and that often occurs in a week or ten days.

If the lesions present granulations then stimulating applications are indicated; silver nitrate solution in 1/10,000 to 1/1,000 dilutions often are effective. If the lesions are of a cystic nature they can be destroyed by cauterizing agents or by electro-coagulation. If the lesions are scar, then gradual dilatation followed by stimulating or astringent applications, such as the silver nitrate mentioned above or zinc sulphate, two grains to the ounce of solution, are called for.

The basis of treatment, however, is dilatation, and this must be carried out to at least F 28. Indeed, the dilatation in certain cases will have to be carried to just short of the production of a temporary incontinence. In such cases the straight Kollman dilator can be used very effectively. Usually dilatation and topical vesical neck and urethral treatment will have to be repeated to effect relief and cure. As to the frequency of such treatments the medical attendant will have to be guided by the relief afforded the patient. The first dilatations are best done in hospital under some form of anæsthesia; later ones can be performed conveniently in the office.

Urethral caruncle can only be treated effectively by excision or electro-coagulation. Local applications of various cauterizing agents are for the most part ineffective. Silver nitrate, 75 per cent, by means of wooden applicator, is the best of these, but it is of doubtful value. And, finally, the urethra must always be dilated if caruncle is present.

REFERENCES

1. BUGBEE, H. G.: Frequency of urination in women, *J. Am. M. Ass.*, 1917, **68**: 693.
2. JUDD, A. M.: Urinary symptoms in women due to urethral pathology only, *Am. J. Obst. & Gyn.*, 1923, **6**: 318.
3. PUGH, W. S.: Strictures of the female urethra, *J. Am. M. Ass.*, 1926, **87**: 1790.
4. STEVENS, W. E.: Diseases and abnormalities of the female urethra, *Calif. & West. Med.*, 1927, **26**: 471.
5. FOLSOM, A. I.: The female urethra: a clinical and pathological study, *J. Am. M. Ass.*, 1931, **97**: 1345.
6. MACKENZIE, D. W. AND BECK, S.: A histopathological study of the female bladder neck and urethra, *Trans. Am. Ass. of Genito-Urin. Surgeons*, 1936.

THE ROLE OF RADIOLOGY IN THE DIAGNOSIS AND TREATMENT OF THE PRIMARY AND SECONDARY LESIONS OF CARCINOMA OF THE BREAST*

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FROM the standpoint of both the diagnosis and treatment of cancer of the breast and its sequelæ, x-rays occupy a very pertinent position. From the time that the patient first presents herself or himself for examination of the breast, until either the permanent disappearance of the tumour or the ultimate demise of the victim, x-rays will help to decide problems of diagnosis, assist in "cure", or palliate the incurable.

In some clinics use is made of x-rays for direct radiography of the breast tissue, with and without the use of opaque solutions injected into the milk ducts, sometimes combined with the injection of gas into the perimammary tissues. We have had very little experience with the first method of diagnosis and no experience with the latter. Indeed we view with a degree of caution the method of injecting gas into the perimammary tissues, as the thought arises that the traumatism caused by this method of examination might be a factor in determining metastasis in the presence of a malignant lesion.

When a tumour which presents the appearance of or arouses suspicion of carcinoma is felt in the breast the employment of x-rays is indicated as a useful diagnostic measure. A general survey of the skeleton or of the chest may reveal evidence of secondary lesions even when the breast is clinically stage I. In such a case the radiological diagnosis helps to confirm the clinical diagnosis of carcinoma, but shows it to be much farther advanced than would seem likely from ordinary methods of examination. The presence or absence of secondary lesions as thus shown is a guide to the particular type of treatment required. Obviously, when secondary lesions are present radical surgery of the breast is not indicated, nor is radical x-ray therapy either as a pre-operative or post-operative measure likely to be of value.

The first indication of metastasis may be the appearance of a secondary lesion of the skull (Fig. 1), or a portion of the spine, pelvis or femurs. The secondary manifestations may be for a time localized to one portion of the skeleton and may not spread to other parts for many months or even a year or two. Secondaries may first appear in the lungs and may not be widespread in these organs for many months.

In those patients showing metastasis to either the lungs or bones or to both our series of 140 cases shows that these parts were involved as follows:—

TABLE I.
DISTRIBUTION OF LUNG AND BONE METASTASIS FROM PRIMARY BREAST CARCINOMA, 140 CASES

	No.	*Percentage*
Lungs	50	36
Bones	66	47
Lungs and bones	24	17
	140	100

These percentages are strikingly in agreement with those reported recently by Pope. An analysis of his tables shows that a similar group of cases, (that is, metastasis to lungs, bones, and to both) showed involvement in 39, 44 and 17 per cent respectively. These figures are ample evidence that it is quite necessary to make a survey of the skeletal system, as well as the lungs when searching for secondary carcinoma. If the lungs alone are investigated there will be an error in diagnosis of about 45 per cent of such cases.

Lung metastasis. — Secondary carcinoma of the lungs and pleura is shown in a variety of forms.

1. Blood-spread metastasis (Fig. 2). Nodular in type, spread through the agency of the pulmonary arteries. The nodules are readily observed in radiographs of the chest. They are small or large, depending upon the duration and speed of growth. They are generally uniform in size, except for the smaller areas of later invasions. They tend to group most heavily in the bases of the lungs. They often appear sud-

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denly and development may be rapid. A large single nodule may be present.

2. Lymph-spread metastasis. (*a*) Permeative type (Fig. 3). Blocking of the hilar and tracheobronchial glands by secondary deposits of cancer may cause retrograde permeation of the peribronchial lymphatics. The extension may be limited in the neighbourhood of the lung roots or may spread widely throughout the lung in a fine network, accompanying the branches of the bronchial tree.

(*b*) Nodular type (Fig. 4). May occur as nodes at main junction points of the peribronchial lymphatics accompanying the permeative type just described. Occasionally reversal of the lymph flow in blocked lymphatics gives rise to embolic lymph spread. The nodes thus formed grow and may invade the lung tissue.

In the permeative type radiographs show a fine or feathery increase in the peribronchial markings. This may be heavy near the hilar region and may be accompanied by shadows of enlarged glands at the lung roots. The peribronchial markings may become coarsened, or circular densities may occur as in the nodular type. In the nodular formations the nodules tend to be larger near the hili and become progressively smaller toward the periphery of the lung.

3. Invasion by contiguity. Breast carcinoma may spread directly to the lungs. Invasion by contiguity may also occur from secondary lymph node growths at the lung roots. Radiographically invasion by contiguity is recognized by a more or less homogeneous density invading neighbouring tissues.

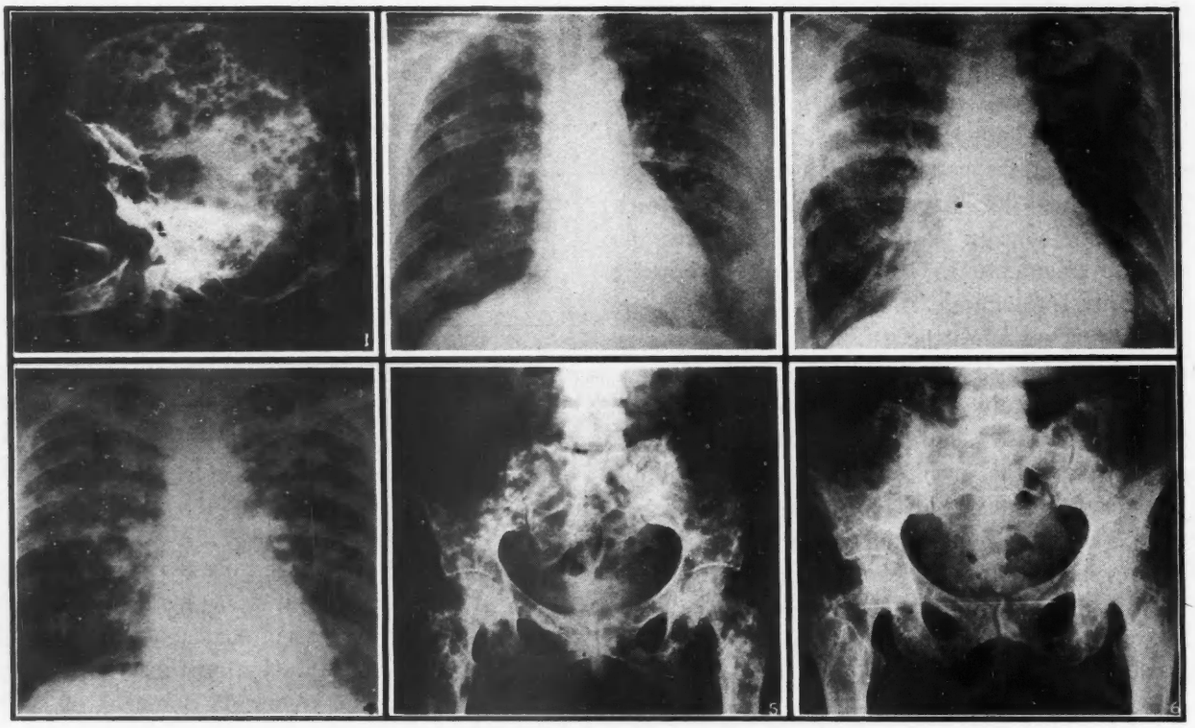

Fig. 1.—Multiple secondary lesions in the skull occurring in a patient with far advanced secondaries throughout the skeletal system. This is a common type of lesion and the circular rarefied areas representing the osteolytic lesions of the disease vary in number from a few to the innumerable areas as seen in this case. **Fig. 2.**—Nodular type of secondary carcinoma of the lungs; blood spread. The emboli in this type of case are disseminated by the pulmonary arteries and are as a rule most numerous at the bases of the lungs. The nodules in this case are large, discrete and well defined. **Fig. 3.**—Diffuse lymphatic permeation of the bronchial tree. The film shows well marked, fine diffuse spread throughout the right lung. The spread is more coarsely marked and is not as far advanced on the left side. **Fig. 4.**—Nodular type of secondary carcinoma of the lungs; lymph spread. The nodules in this type of lesion are usually grouped more heavily near the lung roots where they are largest. As the process spreads radially towards the periphery the nodules are seen to be smaller. Linear markings are seen connecting many of these densities with the lung roots. Although some of the nodules have relatively well defined borders, most of them have fuzzy edges. **Fig. 5.**—The results of x-ray therapy in the treatment of skeletal metastases from breast carcinoma. Film made before treatment. Note the widespread involvement of the pelvis and femurs. Multiple areas of bone destruction are present throughout the skeletal structures seen in the film. **Fig. 6.**—A film made three months after treatment of the patient whose film is shown in Fig. 5. The well-marked degree of recalcification of the bones and the disappearance in a large measure of the widespread mottling formerly present will be readily observed. This process of repair accompanied by relief of pain is an ordinary effect of x-ray therapy administered to secondary skeletal lesions of breast carcinoma.

4. Involvement of the pleura. This shows most commonly simply as a pleural effusion. More rarely nodular metastasis into the pleura is seen. This, as seen in the x-ray film, may look like a small encapsulated pleural effusion.

The symptoms most commonly found in secondary involvement of the lungs and pleura are: (*a*) Dyspnœa, often slight but occasionally distressing, as in the well advanced lymphatic permeative type of lesion. (*b*) Anæmia and loss of weight. (*c*) Localized pain may be present if pleura or ribs are involved. (*d*) Cough may or may not be present. (*e*) Hæmoptysis may occur, but is not profuse.

Skeletal metastasis.—It is of interest to note the distribution of skeletal metastasis in our 140 cases. The incidence is as follows:—

TABLE II.
DISTRIBUTION OF BONE METASTASIS FROM PRIMARY BREAST CARCINOMA. 140 CASES OF SECONDARY CARCINOMA OF LUNGS AND BONE; 90 INVOLVING BONES ONLY

Part	One part alone involved	Percentage of 90 cases bones	Percentage of 140 cases lungs and bones	Combined with other parts
Skull	5	5.5	3.5	21
Spine ...	13	14.5	10.0	38
Pelvis ...	7	8.0	5.0	41
Femurs ..	7	8.0	5.0	37
Humerus*.	0	–	–	1
Ribs	0	–	–	24
Tibia* ..	1	1.0	0.7	–

* Information not complete.

Metastasis to bones may show either as an osteolytic change or as an osteoplastic one. The latter is not common in secondaries from breast carcinoma, and when it does occur is generally combined with the former. Osteolytic change is evidenced by small or large circular areas of rarefaction of bone. These in so far as the x-ray appearance is concerned may vary from small pin-head areas of radiolucency to large areas measuring inches in diameter, as seen occasionally in the skull and pelvis. Osteoplastic change is shown by areas of dense bone formation which are relatively opaque to x-rays and show as whitish patches on the film. Occasionally the two types are combined. In such a case we have observed a skull involved by metastasis which resembled the skull picture seen in Paget's disease of bone. The ribs may sometimes show a localized expansion of the shaft caused by a secondary growth. Areas of bone sometimes show a diffuse radiolucency which blots out parts of bone and presents the "melted ice" appearance sometimes spoken about. It is possible for bones to be involved to a very marked degree and yet the x-ray appearance be that of a general osteoporosis that is not at all characteristic of a secondary malignant lesion. In these cases the first intimation of trouble may be a pathological fracture of a long bone or the crushing of a vertebral body, and the radiographs may show little or no direct evidence of the cause of the fracture.

In doubtful cases it is a recognized rule in radiology that radiographs should be made of the rest of the skeleton and of the lungs, as such procedure may, by showing other evidence of disease, establish the diagnosis. This rule holds for all types of bone tumours.

Let us now return to the problem of the patient. We have just been discussing the question of diagnosis from the point of a general radiological survey of the individual who presents herself, or himself, for examination with a tumour of the breast. The question of whether or not skeletal or pulmonary metastasis is present having been settled, we are now in a position to decide what further use can be made of irradiation.

If there is no evidence of metastasis to the parts just mentioned the point regarding pre-operative irradiation arises. This method of irradiation using fractionated dosage over long periods has not yet been in use long enough to give definite statistics over a sufficiently lengthy period of time to determine its ultimate usefulness. However, there can be no doubt that in most instances pre-operative irradiation brings about a decrease in the size of the lesion, and that in a large percentage of cases this regression of the primary tumour and of the secondary glands in the axilla is quite marked; in some instances the tumour in the secondary glands entirely disappears and cannot even be found microscopically following the removal of the breast and other tissues at operation. Most men who have had experience with pre-operative irradiation are convinced that it is a very useful procedure. It remains for time to tell how useful it is. We administer a pre-operative course of irradiation in our institution, the doses ranging from 2,200 r to 4,000 r or more per port depending upon the reaction of the patient's skin, the size of the breast, the size and type of the tumour, and the patient's constitu-

tional reaction to treatment. These doses cause a well marked reaction of the patient's skin. This reaction is the normal result of treatment and should not be thought of and never mentioned as being a "burn". To speak of a reaction as a "burn" produces a wrong and harmful psychic effect upon the patient. Realizing that more or less fibrosis of the lung and pleura may be caused by heavy dosage, as well as a certain amount of damage to the skin, we are guided also in our prescription of dosage by what we consider in the individual case to be sufficient justification for causing this damage. It is the procedure in our institution to wait for two months following the termination of the irradiation series before these cases are operated upon. The surgical wounds usually heal quite promptly and no trouble is experienced in this regard. Our biggest trouble at the beginning of treatment is to persuade the surgeon and patient that valuable time is not being lost by waiting for a period of two or three months before the operative procedure. Once, however, the surgeon has seen the shrinking of the tumour or the disappearance of it under radiotherapy, no longer is he inclined to assume such an attitude. We do have some little trouble in persuading patients in whom the tumour is no longer palpable at the time set for operation to consent to the surgical procedure which we feel is necessary for a successful treatment.

Inoperable tumours may be rendered operable by irradiation or, as Henry and others have shown, may be treated very well by irradiation alone.

Patients who develop cancer before the menopause may be benefited by a functional castration, using x-rays over the ovaries for this purpose. It has been shown that the ovarian hormone has an effect of stimulating the growth of breast cancer and its secondary manifestations, and if the ovaries are removed or if the ovaries are rendered inactive by irradiation both primary and secondary growths may show regression and in skeletal metastasis recalcification of the bone may take place. We feel that this is a valuable procedure and recommend it in all cases that have passed stage I, and use it sometimes even in stage I growths when we are dealing with a young woman with a malignant type of tumour.

Most of the cases that are referred to us, however, are post-operative ones. These we treat also by means of fractionated dosage over an extended period of time and observe the same rules for dosage as we use in the pre-operative cases. If we are able to give a maximum skin dosage we consider one series of post-operative treatments sufficient and do not use further irradiation unless local recurrences manifest themselves. In treating these recurrences we are guided by the fact that the skin has already been damaged by previous irradiation, and we consider this in deciding how much further irradiation should be used.

In the years following amputation of the breast for carcinoma, surveys of the skeletal system and the lungs are very useful, especially when the patient complains of breathlessness, chronic cough, pain in the chest, pain in the spine, hips, or along the course of the sciatic nerve. These symptoms which should immediately attract attention to the possibility of secondary lesions being present, often masquerade for months under the pseudonyms of "heart trouble", "bronchitis", "pleurisy", "rheumatism", "lumbago", and "sciatica". A radiographic survey in such instances usually will establish the diagnosis. It should not be forgotten, however, that in the early stages of such lesions the x-ray examination may be entirely negative.

A point that should be remembered is that it is dangerous to give definite prognosis as to the duration of life on the strength of the radiological findings (or even for that matter on the strength of the clinical findings). Patients may live for months or years with apparently far advanced lesions. Those who dogmatically prophesy the early demise of patients give credence to the claims of charlatans who afterwards arrogantly assume the credit of having lengthened the lives of these individuals by means of their serums and sophistries.

It is not difficult to recollect the occurrence of the occasional case which shows apparent arrest or even regression of malignant manifestations at a time when no treatment is being carried out and over areas on which no treatment has been given. It follows that if treatment should have been given at such a time the particular form of treatment used would receive credit for the apparent effect upon the disease.

X-rays when used to treat secondary lesions of bone following carcinoma of the breast are usually followed by such satisfactory results

that there can be no doubt as to their value (Figs. 5 and 6). In most cases the effect of irradiation is shown by recalcification or hypercalcification of those areas of bone which are involved by the secondary malignant lesion. This prevents deformity of the bones, compression of the vertebral bodies, and pathological fractures of the pelvis or long bones which are results of decalcification of the bones following invasion by malignant tissue. If these untoward results are already present the effect of x-rays is to prevent further deformity and to aid in the firm union of the fragments of the fracture.

Another effect of x-rays in these cases is to relieve pain. One is well aware that the claim of relieving pain in cancer is an unpopular statement as the chief slogan of nearly all of the so-called "cancer cures" is that if they do nothing else they relieve pain. It is a matter of common experience, however, that the analgesic effect following x-ray therapy over the bones is not a psychic manifestation but a definite result which may last for weeks or months following the treatment. In certain instances patients, previously invalided and bedridden with skeletal metastasis, may resume domestic and social activities and even play golf following a course of radiation. These patients are not cured. After several months or two or three years the lesions may recur in the bones and almost certainly in the meantime the disease will spread to other organs. The point is that, although the issue is almost inevitably fatal, the patient may be transformed from an invalid to a comparatively healthy person for weeks, months or for one or two years, and when the dénouement finally occurs it is relatively rapid due to involvement of other organs.

A plea is made for the use of irradiation as well as other measures in the treatment of the final stages of cancer. It is a matter of common observation that patients who have been "given up" by their medical attendants drift to the irregulars. The full use of our therapeutic resources and that mental consolation which is due to our patients is too often denied them, to our discredit as a profession. It is not fair either to the patient, the patient's family, the profession, or to the medical attendant himself to assume a defeatist attitude at such a time. The following quotation from our own code of ethics would seem most applicable in this regard, "A physician ought not to abandon a case because the disease is deemed incurable, for his attendance may continue to be highly useful to the patient, and comforting to the relatives around him, even to the end of a fatal malady, by alleviating pain, allaying symptoms, and soothing mental anguish. To refuse attendance in such extremity is to sacrifice to fanciful delicacy and mistaken liberality that moral duty which is independent of, and far superior to, all pecuniary considerations."

THIOBARBITURATES IN OBSTETRICS: PENTOTHAL AND THIOETHAMYL*

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BARBITURATES had their inception in the synthesis of malonylurea which Emil Fischer and von Mering[1] performed in 1903. At that time, too, these men substituted sulphur for oxygen on the urea portion of the molecule, and so made diethylthiobarbituric acid. Of this they gave 1 gram to a dog weighing 7 kg. and produced anæsthesia which ended in death 8 hours later. Little attention was paid to such sulphur compounds until Tabern and Volwiler[2] synthesized and characterized a series of disubstituted thiobarbituric acids. They found that several of these are powerful hypnotics of prompt action, from which animals rapidly recover. The sodium salt of one of these, pentothal (1-methylbutyl ethyl malonylthiourea), has been used extensively to produce anæsthesia in human beings since its introduction by Lundy and Tovell.[3] Pratt, Tatum, Hathaway and Waters[4] have studied the anæsthetic and toxic properties of this drug and report that it causes no wild excitement, depresses respiration only in anæsthetic doses, does not disturb the circu-

* The pentothal was supplied by Abbott Laboratories and the thioethamyl by Parke Davis and Company. Our thanks are tendered.

lation, and that, as it is broken down rapidly in the body, it closely resembles the so-called controllable anæsthetics.

Attracted by the reports of prompt action, absence of excitement, and rapid recovery following the administration of pentothal, MacPhail, Gray and Bourne[5] were led to employ this substance in the early stages of labour and have reported its successful administration to 238 women.

Thioethamyl (isoamyl ethyl malonylthiourea) is the name given to the sulphur substitution product of amytal. Gruhzit, Dox, Rowe, and Dodd,[6] working on rats, rabbits and dogs, found that this substance, in comparable doses, was better tolerated, showed somewhat less depression of respiratory function, and caused less severe pathological changes in organs than pentothal.

In view of these declarations, and on account of the indication that thioethamyl has a substantial margin of safety, it was decided to give the two drugs more or less alternately to women in labour. Accordingly 100 cases have been studied with particular attention to the analgesic and amnesic effects. There were 80 primiparæ and 20 multiparæ (para-ii). Such care was taken in the selection of the cases that there were no breech presentations among them, and, other than some pre-eclamptic tendencies in ten of them, the women were healthy.

In 50 instances of the pentothal administration the sodium salt of this drug was used; in the others a change to pentothal acid was made; whereas in those of thioethamyl all were of the sodium salt. It is believed that it would be better to use the acid of either drug, as it is more stable, does not have to be put up in capsules; therefore will be cheaper, and as both drugs are being given by mouth the sodium salts soon become changed to their acids in the stomach.

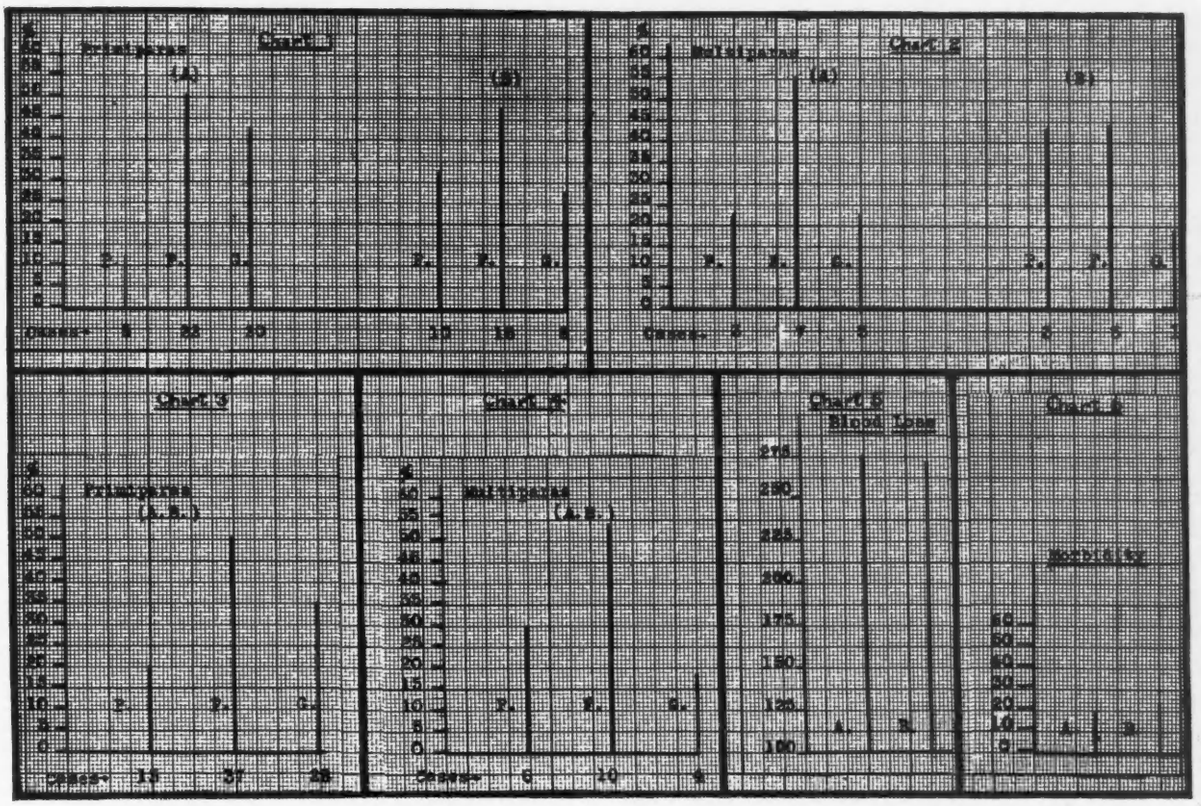
Following the experience of the other observers[5] 4 grains of pentothal are administered as soon as pains are definitely established. One-half hour later 4 grains more are allowed, and this quantity repeated in another half hour. The patient now becomes quiet, works well with her pains, and sleeps in between them. In some instances these three doses suffice; otherwise, when the effects seem to be wearing off, 2 or 3 grains are again given every half to three-quarters of an hour.

By analogy, considering the mentioned doses of pentothal and that thioethamyl is less potent and less toxic than pentothal, it was soon decided to place the initial dose of thioethamyl at 6 grains, to be followed by 4 grains in half an hour, 4 grains more in another half hour, and subsequently, if necessary, by 3 grains at a time, similarly as in the case of pentothal.

Of the 100 patients 60 received pentothal and 40 thioethamyl. With the fully established doses of each drug there was considerable and salutary analgesia, but the degree of amnesia was seldom as marked as one would like. Accordingly, in 50 instances scopolamine (gr. 1/100 to 1/150) was given at the time of the first or second portion of the barbiturate, 38 with pentothal and 22 with thioethamyl. There was then marked enhancement of amnesia.

With respect to analgesia the results obtained are depicted in Charts 1 to 4, and it may be seen at once that they are best with pentothal in primiparæ. These figures with their legend need no expatiation, only to add that these drugs are of little value in the rapid labour of a multiparous woman, there being not enough time for their full therapeutic effects. Although thioethamyl was not so effectual as pentothal, and although its use was accompanied by some excitability in a few cases, yet it is only fair to say that the consequences might have been different with larger doses. There should be further study with this drug in obstetrics.

It is worthy of observation that there were no toxic effects on the mother or fetus with either drug. All of the infants breathed spontaneously and appeared normal in every respect. As noticed by others[5] in the case of pentothal, in this series whenever the fetal heart rate was unduly rapid it would become slowed by either barbiturate, but when within normal limits no change took place. The maternal heart rate is invariably slowed by these sulphur compounds, which fact is partly in agreement with one of the findings of Gruber,[7] namely, that in cats, rabbits and monkeys the thiobarbiturates tend to slow the already rapid heart. In passing it is well to note that this observer has shown also that morphine definitely increases the toxicity of the thiobarbiturates, which was most noticeable in the monkey. In none of the women was there any appreciable change in blood pressure—usually a fall of not more than 10 mm. of mercury with no change in the pulse pressure.



Key to Charts 1 to 4.—P–Poor; F–Fair; G–Good; A.–Pentothal; B–Thioethamal. **Chart 5.**—A.–Pentothal 275 c.c.; B.–Thioethamal 270 c.c. **Chart 6.**—A.–Pentothal 16 2/3 per cent; B.–Thioethamal 20 per cent.

There were no apparent disturbances of kidney function, and the intake and output in all cases remained as they should.

Chart 5 supplies the data concerning loss of blood. It will be seen that the quantities, which are average, are by no means unusual. They rarely exceeded 200 c.c. Nitrous oxide with oxygen, occasionally with some ether vapour, was the anæsthetic used at the time of delivery.

Ultimately, the puerperium of the mother was not affected, that is, very few febrile cases occurred, as is set forth in Chart 6. Ultimately, too, infantile growth was not retarded, and the babies developed normally during their stay in hospital.

It is especially important to note that in not a single instance was there any retardation of labour following the administration of either pentothal or thioethamyl; on the contrary, labour was very definitely shortened. This is difficult of explanation, but it does seem that these sulphur substances cause the cervix to dilate more readily during the first stage.

SUMMARY

1. Pentothal and thioethamyl, two sulphur derivatives of barbituric acid, have been studied *pari passu* with regard to their analgesic and amnesic effects in obstetrics.

2. Of 100 selected patients, 80 were primiparæ and 20 multiparæ, and 60 received pentothal, while 40 were given thioethamyl.

3. The degree of analgesia was very fairly good following the administration of pentothal, and only moderately good after thioethamyl.

4. Amnesia was not nearly so marked as one would like with either drug. It should be enhanced by the use of scopolamine at the time of the first or second dose of the thiobarbiturate, and not after.

5. There was no excitement from pentothal, and only slight excitement in a few instances from thioethamyl.

6. The duration of labour is shortened with the use of either compound.

7. No harmful effects were noted in the mothers or babies.

8. Thioethamyl deserves further study.

REFERENCES

1. FISCHER, E. AND VON MERING, J.: Ueber eine neue Classe von Schlafmitteln, *Therap. der Gegenw.*, 1903, 44: 97.

2. TABERN, D. L. AND VOLWILER, E. H.: Sulphur-containing barbiturate hypnotics, *J. Am. Chem. Soc.*, 1935, 57: 1961.

3. LUNDY, J. S. AND TOVELL, R. M.: Some of the newer local and general anæsthetic agents, *Northwest Med.*, 1934, 33: 308.
4. PRATT, T. M., TATUM, A. L., HATHAWAY, H. R. AND WATERS, R. M.: Sodium ethyl (1-methylbutyl) thiobarbiturate, *Am. J. Surg.*, 1938, 31: 464.
5. MACPHAIL, F. L., GRAY, H. R. D. AND BOURNE, W.: Pentothal sodium as a hypnotic in obstetrics, *Canad. M. Ass. J.*, 1937, 37: 471.
6. GRUHZIT, O. M., DOX, A. W., ROWE, L. W. AND DODD, M. C.: A pharmacological study of certain thiobarbiturates, *J. Pharmacol. & Exper. Therap.*, 1937, 60: 125.
7. GRUBER, C. M.: The effects of anæsthetic doses of sodium thio-pentobarbital, sodium thio-ethamyl and pentothal sodium upon the respiratory system, the heart and blood pressure in experimental animals, *J. Pharmacol. & Exper. Therap.*, 1937, 60: 143.

THE DANGERS OF EMPLOYING THORIUM DIOXIDE SOLUTION IN MAMMOGRAPHY*

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HICKEN and his colleagues[3] have advocated the use of thorium dioxide solution in mammography. They claimed that this contrast medium was safe and caused no untoward reactions afterwards in the breast, provided the thorotrast was lavaged out of the breast by the use of normal saline. The substance, thorotrast (Heyden), is a stabilized 25 per cent solution of thorium dioxide in a colloidal state. Thorotrast possesses definite value in mammography, in that it gives excellent clear-cut x-ray shadows of the breast ducts. When the injection of thorium dioxide is followed by a mastectomy there can be no question as to the safety of the procedure, if asepsis has been observed. However, our interest has been directed to those breasts that have been injected with thorotrast and were not promptly removed surgically.

There are four serious objections that can be raised to the use of thorotrast for diagnostic purposes. *First:* It remains permanently in the subcutaneous tissues into which it is injected, being phagocytized *in situ* by the various cells of the reticulo-endothelial system. *Second:* This substance has a high degree of radioactivity, emitting the very dangerous burning alpha-rays that have been estimated by Taft[11] to be about 10,000 times as toxic to human tissues as the therapeutic gamma-rays of radium. Colloidal thorium dioxide breaks down into mesothorium and radiothorium. Martland[5] has graphically described what happened to workers who moistened the tip of paint brushes, to point them, with their lips, when applying luminous paint to the dials of watches, etc. Mesothorium and radiothorium were the two chief elements in that paint. Such accidental ingestion of minute particles of this luminous paint later caused widespread bone destruction about the face that frequently progressed into an osteogenic sarcoma. Taft[11] found that a dosage of 75 c.c. of thorium dioxide solution possessed the gamma-ray equivalent of 1.37 micrograms of radium. He also showed that mesothorium and its products of decay had a greater penetration and velocity than the alpha-rays of radium. *Third:* Recently, Selbie[9] has reported additional studies with this same substance in which rats and mice were given subcutaneously two doses of 0.3 c.c. and 0.1 c.c., respectively, two weeks apart. Of the surviving animals that lived more than one year after the injections it was found that 58 per cent of the rats and 26 per cent of the mice had developed a tumour at the point of inoculation. Most of these neoplasms were spindle-cell sarcomas, believed to result from a combination of the effects ascribed to the radioactivity and the inflammation caused by the subcutaneous injection of the thorotrast. Nicaud and Hamburger noted the onset of an acute pernicious anæmia following the therapeutic use of thorium dioxide. *Fourth:* Recent studies by Reis and Mesirow[7] and by Romano and McFetridge,[8] demonstrate that, despite careful lavaging out of the breast ducts after mammography, a large amount of thorotrast remained behind. Many months later such a breast gave a roentgenogram practically identical with the original film.

Sowers and Masson[10] reported an instance of extensive fat-necrosis in a breast injected 18 days previously with thorium dioxide. Reis and Mesirow[7] recorded 3 similar instances recently. Romano and McFetridge[8] reviewed 25 cases similarly injected with thorotrast: 23 were operated upon. In four examples there was a delay varying from 3 days to a month following injection. These 4 breasts revealed progressive marked inflammatory reactions directly proportional to the lengthened time-interval between the injection and the subsequent breast opera-

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tion. Two recent editorials[1, 2] and the excellent summary of the literature by Reeves and Stuck[6] have all expressed the opinion that thorotrast has serious contraindications to its continued use as a diagnostic medium in the human body. Yater and Whitmore[12] followed 65 patients to necropsy with periods ranging from a few days to 3 years after the injection of usually 75 c.c. of thorotrast for the obtaining of a hepatosplenogram. In no case were they able to find any sign of injury to the tissues or any cellular reaction that could be the result of the presence of the thorium dioxide. However, in sharp contrast to the above findings were the studies of another group of workers. Lanari, Jorg, and Aguire[4] showed by experiment over a four-year period that thorotrast produces a slowly progressive cirrhosis of the liver and a hyperplasia and fibrosis of the spleen, partially due to the radioactivity of the thorotrast. Ultimately other neighbouring abdominal viscera are secondarily involved.

To date, 8 instances[7, 8, 10] have been recorded of breasts injected with thorium dioxide solution in which immediate operation was not done. A considerable period of time followed before their signs and symptoms became severe enough to necessitate the surgical removal of portions of the breast, coupled with the suspicion that a malignant tumour might possibly be present.

I wish to add two additional cases of a similar character that were observed in my own practice.

CASE 1

Mrs. J.R.T., white, housewife, aged 32 years, noticed multiple nodules in the left breast 7½ months ago. Another mammography was done, using thorotrast. The breast ducts were lavaged out afterwards. A diagnosis of chronic cystic mastitis was made and operation was not advised. Recently, she presented herself for advice, complaining of progressive pain, induration, and an increasing painless new nodule in the left breast. Examination revealed a moderately tender, nodular, cystic breast with one area of increased firmness, measuring 3 x 3 x 2 cm. that had a slight fixation to the overlying skin. A carcinoma was suspected. However, the biopsy revealed only a marked foreign-body reaction to be present. A simple breast amputation was done. The convalescence was uneventful.

CASE 2

Miss A.M.S., white, college student, aged 20 years, noticed a solitary nodule near the nipple of the right breast six months ago. Her physician performed a mammography, using thorium dioxide solution. A benign solitary tumour was demonstrated. It was believed to be a fibro-adenoma. She would not consent to a local excision of the tumour at that time. No lavage of the breast ducts was done. Three months ago she noted the onset of a new progressively enlarging painless tumour radiating out from the nipple. She was afraid that this new neoplasm was malignant. Our preoperative diagnosis was a possible foreign-body reaction, resulting from the previous injection of thorium dioxide solution. The lesion measured 4 x 3 x 3 cm. The biopsy of this nodule substantiated our none too sure preoperative opinion. A simple breast amputation was performed. The incision healed rather slowly. Fig. 1 demonstrates the microscopic appearance of a typical area of the breast lesion, being similar to that found in Case 1.

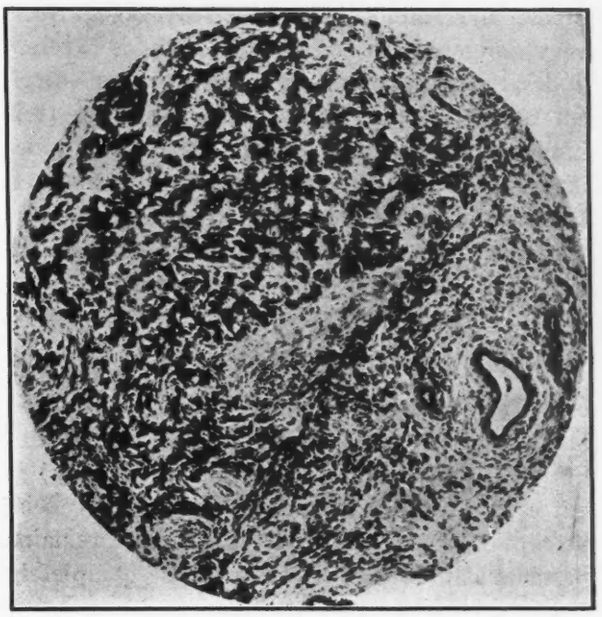

Fig. 1.—*(Case 2)* Breast tissue, showing one milk duct. Note the heavy collection of minute droplets of thorium dioxide solution inside of numerous macrophages scattered throughout the breast, obliterating normal microscopic structures. Diffuse fibrosis, hyalinization, and chronic inflammation are apparent. The thorium dioxide solution had been injected 6 months before. No duct lavage was done (low power).

COMMENT

Two patients developed pain, tenderness, and pseudo-tumour formation that resembled a carcinoma, following the diagnostic injection into the breast ducts of thorotrast some six or more months previously, in order to perform a mammography. X-rays taken after that time-interval revealed a considerable amount of thorium dioxide solution to be still present in the breasts. The symptoms in these two instances were of such severity, in addition to the fear that the new lesion might be malignant, that simple mastectomies were considered to be the only suitable course of action.

The microscopic appearance of the tissue demonstrated rather marked foreign-body reaction. The droplets of thorium dioxide were contained within a multitude of macrophages. At first glance the microscopic appearance of the lesions closely resembled carcinoma and the inexperienced observer might become confused. Areas of necrosis, hyalinization of the connec-

tive-tissue framework of the breast, and foreign body giant cells were seen.

Thorium dioxide disintegrates into mesothorium and radiothorium, which are proved to be highly dangerous substances in human tissues. Since thorium dioxide remains *in situ* in the breast and cannot be removed by lavage it is very dangerous to employ this definite carcino- and sarco-genic substance, unless prompt surgical removal of the breast is to be done. It is highly doubtful if thorotrast gives any more information in the case of a given diseased breast than would be derived from the far safer procedures of an intelligent physical examination and a properly performed biopsy of questionable areas.

CONCLUSIONS

1. The injection of thorium dioxide solution into the breast ducts for the purpose of obtaining an x-ray of that breast (mammography) is not a safe procedure, unless the breast is to be promptly removed. This substance remains permanently *in situ* and cannot be completely removed by lavage.

2. Thorium dioxide is highly radioactive, surpassing its parent, radium, in regard to the emission of harmful alpha-rays.

3. Two case-reports are recorded in which thorotrast was injected into the breast for mammography. These patients after six or more months developed pain, inflammation, and a pseudo-carcinomatous tumour formation in that breast. Microscopically, the breast lesions were characterized by markedly severe foreign-body reaction, fibrosis, hyalinization, focal necrosis, and chronic inflammation. Both of these lesions gave one the impression that had sufficient additional time been allowed to elapse a malignant tumour would have probably developed.

REFERENCES

1. Editorial: Potential hazards of the diagnostic use of thorium dioxide solution, *J. Am. M. Ass.*, 1937, **108**: 1656.
2. Editorial: Is thorotrast safe? *Brit. M. J.*, 1938, **1**: 903.
3. HICKEN, N. F., BEST, R. R., MOON, C. F. AND HARRIS, T. T.: The pre-operative visualization of breast tumours, *J. Am. M. Ass.*, 1937, **108**: 864.
4. LANARI, E. L., JORG, M. E. AND AGUIRRE, J. A.: Résultats des recherches effectuées sur les blocages viscéraux en vue d'un exploration radiologique, *Presse méd.*, 1937, **45**: 1562.
5. MARTLAND, H. S.: The occurrence of malignancy in radioactive persons: A general review of data gathered in the study of radium dial painters, with special reference to the occurrence of osteogenic sarcoma and the inter-relationship of certain blood diseases, *Am. J. Cancer*, 1931, **15**: 2435.
6. REEVES, D. L. AND STUCK, R. M.: Clinical and experimental results with thorotrast, *Medicine*, 1938, **17**: 37.
7. REIS, R. A. AND MESIROW, S. D.: Studies in the evaluation of mammography, *J. Am. M. Ass.*, 1938, **110**: 1900.
8. ROMANO, S. A. AND MCFETRIDGE, E. M.: The limitations and dangers of mammography by contrast mediums, *J. Am. M. Ass.*, 1938, **110**: 1905.
9. SELBIE, F. R.: Tumours in rats and mice following thorotrast injection, *Brit. J. Exper. Path.* 1938, **19**: 100. Abstract: *Brit. M. J.*, 1938, **2**: 13.
10. SOWERS, B. F. AND MASSON, J. C.: Mastitis following the use of thorium dioxide: Report of case, *Proc. Staff Meetings of Mayo Clinic*, 1937, **12**: 529.
11. TAFT, R. B.: The radioactivity of thorium dioxide solution. A preliminary report, *J. Am. M. Ass.*, 1937, **108**: 1779.
12. YATER, W. M. AND WHITMORE, E. R.: Histopathologic study of tissues of 65 patients injected with thorium dioxide solution for hepatosplenography. With a follow-up study of 10 old cases, *Am. J. M. Sc.*, 1938, **195**: 198.

THE IMPORTANCE OF THE DETECTION AND EVALUATION OF EARLY HYPERTENSION

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BLOOD pressure in all its aspects has occupied considerable space in the journals of our profession. We have noted with interest the blood pressure findings in some thousands of reports of periodic health examinations, completed by over 2,500 Canadian physicians. This represents a good cross section of our profession. It is my intention to give some of the impressions we have formed in studying these reports. I have been struck with the variations of opinion held by the profession with reference to blood pressure. One definite impression we have formed is that many members of our profession do not consider a moderate rise in blood pressure as having much significance. Let us ask ourselves this question: What increased blood pressure readings are significant? To answer this we can turn to advantage to the investigations of our American and Canadian insurance companies. To answer the question properly we must also have a definite idea as to what is the average blood pressure of adults. J. M. Livingston[1] states:

> "The average blood pressure in adults of all ages has been found in life insurance examinations to be 127 mm. systolic and 83.5 mm. diastolic." He goes on to say: "While these figures give the average blood pressure for the various ages, I am not prepared to say they represent the normal blood pressure. From a clinical viewpoint one must allow for normal abnormalities depending on build, temperament, excitement, etc. From an insurance study we can say the best mortality is

obtained in those whose blood pressure is somewhat lower than average. Even small variations in blood pressure have a definite effect on the mortality rate."

Our experience would lead us to believe that many physicians consider normal blood pressure to be much higher than that suggested in the above quotation. Commenting upon this attitude of the profession, Arthur Hunter[2] makes the following statement:

"The general viewpoint of physicians is that a blood pressure of from 10 to 20 points above the average may be disregarded as there is no clinical reason for expecting an extra mortality, but the mortality of the companies on cases accepted as standard risks is not in accord with their views."

In 1932 Hunter found that adults up to thirty-nine years of age having a systolic blood pressure of 130 to 135 had a rise of 17 per cent in mortality above the expected death rate. For those 40 to 49 years of age, having a blood pressure of systolic 140 to 145, the mortality rate was 34 per cent higher than expected. Another mortality investigation by one of our largest American insurance companies showed a rise of 23 per cent where the diastolic blood pressure was 92 to 96. Riesman[3] states:

"A systolic blood pressure of 140 to 150 in an individual is not to be ignored." He goes on to comment as follows: "It is important to make the diagnosis of essential hypertension in the early stages for treatment will then be of most avail."

When a group of apparently healthy adults have had a regular physical examination, either annually or biannually, a certain percentage will show for the first time a rise of blood pressure. In examinations such as this we consider 140/90 as an early hypertension. As suggested by our previous remarks the significance of this initial finding is not properly appreciated at times by the examining physician. Assurance is given to the examinee that it is only temporary, due to a worrisome day, etc., but emphasis being placed on the fact that it *is* "temporary". The significance of this transient rise in blood pressure has been overlooked by the examiner. It is a very small percentage of people who do not show a similar or higher reading at subsequent examinations. Riesman, whom I have already quoted, states:

"A labile blood pressure showing swings from high to low is common in persons who later show a permanently elevated blood pressure."

The periodic health examination is one of the ways by which we can detect an early hypertension. The patient himself may be entirely unaware of anything wrong; as long as the heart is competent and able to counteract the resistance symptoms are minimal or absent.

Bolt,[4] of New York, speaks along the same lines. After referring to certain investigations *re* increased blood pressure he makes these remarks:

"Investigations indicated that an extra mortality is to be expected where the blood pressure has at some time been found elevated. There are still too many clinicians who underestimate the danger of a moderate elevation of blood pressure. . . . It is probable that those of us in insurance medicine see more evidence of early cardiovascular-renal disease than the average physician. Too many of these cases come to their doctors when it is too late to do much good. If we disseminate our knowledge as widely as possible and whenever opportunity offers, we may in time help to prolong lives."

Most of us are not in "insurance medicine" but the general practitioner doing periodic health examinations is in the same position as an insurance examiner. He has the opportunity of noting early cardiovascular-renal disease. He can give advice and help which will prolong lives. Very often an examining physician excuses a rise in blood pressure as being due to fatigue after a heavy day. We doubt very much whether fatigue has a great deal to do with a rise in blood pressure. In an effort to determine the part played by fatigue in blood pressure, Dr. H. C. Cruikshank and his associates[5] in the home office of the Manufacturers Life Insurance Company made a study of 17 members of their staff. Blood pressure readings were made three times each working day for one month, at 9 a.m., 2 p.m. and 5 p.m. The findings are summarized as follows:

	Average Blood Pressure Readings		
	9 a.m.	*2 p.m.*	*5 p.m.*
Persons (Average age 30) (Ages 20 to 47)	111/67	114/67	110/69
Males (Average age 31) (Ages 20 to 39)	116/70	118/70	115/71
Females (Average age 30) (Ages 20 to 47)	108/65	111/64	107/66

An interesting finding which came out of this investigation was the increased range with both systolic and diastolic readings which occurred with the female members of the staff. As you will note in the above summary the average variation during the day was about 3 points in the systolic and 1 point in the diastolic. It was

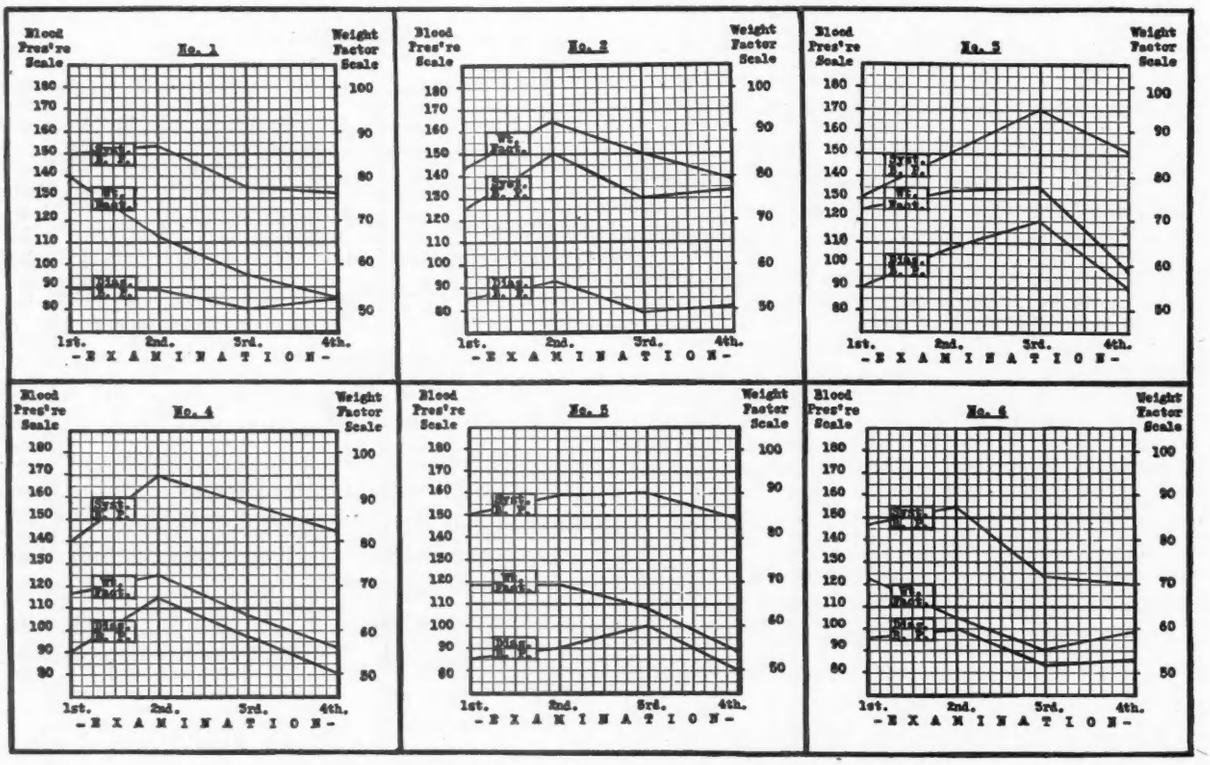
found that on the day preceding the onset of menstruation the systolic readings varied from 12 to 28 points during the day and the diastolic from 8 to 20 points.

To check the above findings the writer took morning and afternoon blood pressure readings for two successive days on 10 labourers and 14 office workers. The following are the findings:

Average age—10 labourers—41.5 years.				
Average systolic	9.00 a.m.	118.5	4.00 p.m.	124.0
Average diastolic	9.00 a.m.	78.9	4.00 p.m.	82.0
Average age of 14 office workers—30.9 years.				
Average systolic	9.30 a.m.	111.5	4.30 p.m.	112.5
Average diastolic	9.30 a.m.	76.0	4.30 p.m.	76.4

health habits, overweight, etc., obtain very encouraging results. We are all aware of the tendency to hypertension in those overweight, particularly when the overweight is associated with increased abdominal measurement. I have chosen from the files of the Canadian Medical Institute a few examples to show what can be done with such persons. To best illustrate the improvement in blood pressure in these cases I have prepared six graphs. The weight factor is a purely arbitrary combination of girth and weight obtained by the following method:

$$\frac{\text{Weight} \times \text{Girth}}{100} = \text{Weight factor.}$$



I have for some years given these employees periodic health examinations, so that the emotional element was reduced to a minimum as they were all well known to me. I realize that the groups mentioned are small in number and the findings, therefore, cannot be said to prove that fatigue does not cause a rise in blood pressure. However, I can say that it does bear out the findings in the reports submitted to the Canadian Medical Institute.

I have endeavoured to show that a moderate rise in blood pressure which may appear to the physician as being only a transient event is in all probability an early indication of hypertension. It is with such that we can, by correction of faulty living and working conditions, faulty

In cases where overweight is a factor in causing the onset of hypertension, experiences such as these suggest the possibility of controlling this condition. In an apparently healthy adult the initial finding of a rise in blood pressure should receive serious consideration. It should never, unless after exhaustive investigation, be looked upon as a transient finding. The periodic health examination offers the best possibility of detection of early hypertension in the apparently healthy adult.

REFERENCES

1. LIVINGSTON, J. M.: Blood pressure, normal and abnormal, *Canad. M. Ass. J.*, 1934, 30: 54.
2. HUNTER, A.: Trans. Actuarial Society, 1933.
3. RIESMAN, D.: Thoughts on hypertension, *Ann. Inter. Med.*, 1937, 11: 335.
4. Proc. Ass. of Life-Insurance Medical Directors of America, October, 1937.
5. CRUIKSHANK, H. C. *et al.*: To be published.

OVER-TREATMENT IN SYPHILIS

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THE manifestations of poisoning from drugs used in the treatment of syphilis are largely divisible into three groups, acute poisoning, idiosyncrasy, and chronic cumulative effects. Of these three, the arsphenamines are more prone to cause acute or idiosyncratic reactions. Gastro-intestinal upsets are frequent, and the skin, the smaller blood vessels, bone marrow, and the liver, are especially susceptible. Heavy metal reactivity is more often cumulative in nature, and mercury in particular is a marked gastro-intestinal and kidney irritant, its prolonged use commonly resulting in weakness, general debility, and varying degrees of anæmia.

Severe reactions to bismuth preparations, excluding those due to technical errors in administration, are relatively uncommon. Mild stomatitis is frequently seen, while more rarely headache or joint pains, bismuth "grippe", or a chronic, patchy, eczematoid dermatitis, may occur. Moore states that bismuth (alone) in average therapeutic dosage is remarkably free of any toxic manifestations.[1] There is no doubt, however, that the combined use of an arsphenamine and of bismuth results in an increased number of reactions. Stokes[2] noted that when arsphenamine was used alone 32.7 per cent of reactions occurred, in comparison to 56.3 per cent when combined arsphenamine-bismuth therapy was given. In many clinics at the present time the combined use of neoarsphenamine and bismuth, given simultaneously, is reserved for relatively young, robust individuals, and in patients in whom the disease is comparatively recent. With these exceptions, the two drugs are usually administered alternately.

During the past few years I have observed several examples of a well defined over-treatment syndrome, occurring in patients receiving combined neoarsphenamine and bismuth, which although well known to syphilologists, has not received adequate recognition in the literature. The gradual development and insidious nature of the symptom-complex make it particularly susceptible to misinterpretation, and many patients have been precipitated into actual mental or physical breakdown by the persistence of misguided therapeutic measures. Three patients illustrating this syndrome will be presented, and a brief analysis of its salient features will be made. A fourth patient, with manifestations of both bismuth and arsenical intolerance, but lacking the special features of the syndrome, will be presented as a basis of comparison. A fifth case will be included to illustrate the influence of arsenical therapy in the production of some of the characteristic features.

CASE 1

H.T., an English Canadian man of 37 years, was found to have a long standing syphilitic infection, with the remains of an old chorio-retinitis and no evidence (as revealed by absence of physical findings) of active infection. His general health was good. Antisyphilitic treatment was begun and in a two-year period he received 11 injections of neosalvarsan and 47 of bismuth. At the end of this period an inactive dermatophytosis of the feet flared up and an ill-defined patchy, eczematoid dermatitis appeared on the forearm flexors, and over the left side of the thorax. The latter was apparently an abortive herpes zoster. Due to the failure of the eruption to clear after a month of soothing measures, the possibility of bismuth dermatitis and secondary fungus disease was considered and his doctor was advised to discontinue treatment. This was done and two months later the skin was clear and the general condition was good. Despite, however, recommendations that treatment be indefinitely suspended, the attending physician, because of the persistently positive blood Wassermann reaction, again started antisyphilitic therapy, and in the next two years 26 more injections of neosalvarsan and 50 of bismuth were administered. Early during the course of the treatment the patient began to complain of increasing nervous irritability, "jumpy" feelings, headache and stomach distress with much gas and some constipation. These symptoms continued and treatment was intensified, probably due to an assumed syphilitic basis for the symptoms. Weakness appeared, he was unable to eat, his appetite became very poor, and severe insomnia developed. Finally, at the end of the 2-year period the patchy, eczematoid dermatitis recurred, this time much more extensively and severely than before, and he was again seen and thoroughly examined but no evidence of late visceral syphilis was found. The blood Wassermann reaction was again strongly positive. Under the assumption that the symptoms were largely due to chronic metallic poisoning he was advised to discontinue treatment permanently, and soothing local and sedative measures were prescribed. In 4 weeks the eruption had entirely disappeared and his general condition had greatly improved. Six months later he was entirely well except for some gastric discomfort and gas, attributable to a residual gastroptosis.

CASE 2

D.M., a French Canadian man of 27 years, was seen because of the presence of a persistently positive blood Wassermann reaction. He was rather asthenic in appearance and complained of chronic fatigue, loss of appetite, and marked nervous irritability. He developed early syphilis in 1930 and was treated during the next 4 years with alternate courses of neosalvarsan and bismuth. The

neosalvarsan was given initially in a dosage of 0.9 grams and he gradually became increasingly reactive to successive injections. Despite this fact, the arsenical medication was continued, and it was at this time, when gastro-intestinal, urticarial, nitritoid reactions, along with chills and fever, almost constantly appeared, that the nervous irritability and fatigue first developed. The blood Wassermann reaction remaining strongly positive under treatment, the injections were continued at an accelerated tempo until, after the end of a 4-year period, he had received approximately 130 injections of neosalvarsan and between 75 and 100 injections of bismuth. During this period no attempt was made to ascertain the cause of the persistently positive Wassermann test, and neither physical examination nor examination of the spinal fluid was performed. He then consulted another physician who referred him to me for further management. Physical examination revealed a very soft systolic murmur at the right base of the heart, but there was no confirmatory evidence of early aortitis. The knee, ankle, and elbow jerks were slightly hyperactive and there was an abortive clonus on both sides. A blood Wassermann test was strongly positive on repetition. Spinal fluid examination was as follows: protein slightly increased; cells 25; Wassermann 444; colloidal gold 44455321000. It seemed obvious that this man was suffering from over-treatment. While asymptomatic paresis was undoubtedly present it was felt that his symptoms were not due to the active syphilis of the brain. He was accordingly placed on a short rest, during which time the symptoms completely disappeared. He was then given approximately 100 injections of tryparsamide, with intervening malarial therapy, and two years later both blood and spinal fluid were negative and he was in excellent health.

CASE 3

J.G., an English Canadian man of 56 years, was referred to the author for further treatment of his syphilitic infection. His chief complaints were a recurrent, gradually progressive, severe, boring type of headache, of some 5 years' duration, and a marked degree of fatigue and nervous irritability. He felt fairly well until the onset of the headaches 5 years ago. During the past 3 or 4 years he complained of increasing nervousness, which consisted of marked irritability and inability to control his temper and definite excitability when attempting to drive his car. His memory had been gradually failing during the previous two years and he had lost a considerable amount of weight. The onset of his syphilitic infection was 41 years ago, at which time a solitary ulcer appeared on the penis. No treatment was given. His blood Wassermann reaction was found to be positive in 1933, and without further examination he was placed on antisyphilitic treatment. The exact number of treatments could not be determined, but he received approximately 60 injections of a form of mercury, 50 injections of bismuth, 15 injections of colloidal mercury sulphide, 6 of mapharsan, and 2 of neosalvarsan. A second physician resumed treatment with neosalvarsan, and shortly after the patient developed a severe attack of thrombocytopenic purpura with hæmorrhages in the skin and from the mouth and rectum. Heavy metal therapy was begun, however, during his convalescence from this attack. During this entire period the symptoms were becoming more severe and gradually progressive. Despite the previous intolerance to arsenical therapy treatment with mapharsan was given. Because of the continuance of the symptoms he was then referred to me for further management. The approximate treatment totals, according to the patient, were about 125 injections of heavy metal and 25 to 30 of arsenic. The past history revealed pneumonia, two attacks of furunculosis, and a large carbuncle on the back of the neck. For the past 8 years he had been bothered with a chronic nasal catarrh, with blockage of the right nostril and a considerable discharge of purulent material and of blood. He stated that he had been subject to at least three acute attacks, each lasting approximately one week, every month. When these attacks appeared the headaches were invariably aggravated. He consulted an oto-laryngologist, who told him that the nasal condition was syphilitic in nature. It is significant, however, that there had been no improvement during his long siege of antisyphilitic treatment. Examination showed the nasal septum to be deviated to the left, and a chronic rhinitis present. The clavicles were of massive size, and there was a moderate enlargement of the middle third of the right tibia, probably due to an old, inactive, syphilitic osteoperiostitis. The heart was enlarged and there was a systolic murmur at the apex. The blood pressure was 190/100. The left pupil was slightly larger than the right, and the right was irregular in outline. Speech was not slurring, but a marked tremor was present around the mouth. The blood Wassermann and Kahn tests were strongly positive on repetition, but the spinal fluid was normal in all respects. A diagnosis of inactive syphilis and over-treatment was made, and all antiluetic therapy was immediately and permanently discontinued. He was placed on a moderately restricted diet and was given mild sedation and a short course of ultra-violet lamp therapy. At the end of one month's time his symptoms had disappeared.

CASE 4

H.E., an English Canadian man of 48 years, was referred to the author for evaluation of a long-standing syphilitic infection. His general health was good with the exception of a mild, chronic, bronchitis, chronic rhinitis, and of recurring attacks of acute sinusitis over a period of years. An ulcer developed on the penis in December, 1913, and was treated with eight injections of old salvarsan, followed by mercurial inunctions over a three-year period. Treatment was resumed in 1919, and during the next thirteen years he received approximately 400 injections of mercury. The blood Wassermann reaction was found to be strongly positive in 1926. In 1932 he was seen by another physician, who found the physical examination normal, the spinal fluid examination negative on several occasions and the blood Wassermann test positive. From 1932 through 1934 he received 50 injections of neosalvarsan (average dosage 0.75) and 50 of a bismuth compound. In December, 1933, a vesiculo-papular, oozing, eczematoid dermatitis appeared on the hands and forearms. With the continuation of treatment it gradually extended, to involve the entire upper and lower extremities as a confluent, chronic dermatitis, extremely resistant to treatment. With discontinuation of antisyphilitic treatment in 1934 the eruption, although stubborn, became intermittent. After a severe relapse, with hospitalization, foreign protein shock therapy, etc., the eruption completely involuted. In the fall of 1935, because of the persistently positive blood Wassermann reaction, antisyphilitic treatment was again begun, and up until April, 1937, he received approximately 40 injections of neosalvarsan (average dose 0.9 g.) and an equal amount of bismuth. In all he had received 100 injections of salvarsan and neosalvarsan, 90 of bismuth, approximately 400 of mercury and mercury inunctions for a 3 year period.

About 6 weeks before the termination of antisyphilitic therapy in 1937, he began to feel run down and lost considerable weight and strength. Severe indigestion developed and he became incapacitated. Forty-two days after the last treatment with neosalvarsan these symptoms culminated in the development of a moderate jaundice. He gradually regained his former health after two more months of rest.

Examination, in November, 1937, revealed chronic infection of the gums with much alveolar absorption and pyorrhœa. The liver was just palpable on deep inspiration. The blood pressure was slightly elevated 160/94, and there was a slight systolic murmur at the 4th left interspace. The examination was otherwise negative. The blood Wassermann reaction was 410, the Kahn 300. Fluoroscopy revealed a normal heart and aorta. A diagnosis of longstanding, inactive syphilis was made, the patient was placed on observation, and has remained in good health to date of writing, 6 months later.

CASE 5

M.F., a frail, undernourished Canadian housewife, aged 24, was referred to the author for evaluation of her syphilitic infection. The presence of syphilis was discovered in May, 1933, by a positive blood Wassermann reaction, found while hospitalized after an attempted abortion for a spurious pregnancy. Treatments were begun with neosalvarsan, which caused episodes of vomiting, and with bismuth. She was pronounced cured after 18 injections of neosalvarsan and 6 of bismuth, without, however, a confirmatory physical, blood, or spinal fluid examination. Two months later perianal mucous patches developed and she consulted a second physician. The Wassermann test was positive, and treatment was given with neosalvarsan, in a dosage up to 0.9 grams. Typical nitritoid reactions occurred after each treatment, later nausea and vomiting appeared, lasting from one to four days. A third physician continued the arsenical therapy in a dosage of 0.9 grams. She developed delayed gastro-intestinal reactions after each treatment, and with the persistence of therapy a chronic "stomach trouble". Immediately after the last injection she had a severe attack of jaundice and was in bed for several months. During this period more fatigability and serious irritability developed. She was bothered with shifting pains in the knees, arms and legs, moderate dyspnœa, and a chronic "bronchial" cough. After a temporary hospitalization in November, 1935, antisyphilitic treatments were again given, and during the next year she received about 15 injections of neosalvarsan and about 10 of bismuth. The jaundice did not recur, but the other symptoms persisted and became progressively severe. She received in all 51 injections of neosalvarsan and 14 of bismuth. In February, 1937, pelvic inflammatory disease developed, and she was sent to the Royal Victoria Hospital for further management. After three weeks of hospitalization there was a marked diminution in the pelvic symptoms.

On examination the patient was very nervous and irritable and she was greatly overwrought over the status of her syphilitic infection. Having been told that her previous symptoms were due to progressive syphilitic changes she now feared a fatal outcome.

Examination revealed slightly unequal but well reacting pupils. The deep and superficial reflexes were markedly hyperactive, and there was an abortive clonus on both sides. The blood pressure was low, 104/58, and there was slight lower abdominal tenderness. Examination was otherwise negative. The blood Wassermann reaction was 410, the spinal fluid examination and x-ray of the heart and aorta normal. A diagnosis of inactive syphilis and over-treatment was made, and the patient was placed on a three months' rest, which was followed by intermittent courses of bismuth in small dosage. The symptoms promptly disappeared.

DISCUSSION

The distinctive symptom-complex shown by cases 1, 2, and 3 exhibits certain clinical features. The patients all complained of a striking degree of nervous irritability, not specifically referable to inherent or environmental factors. It was evinced as an exaggerated response to external stimuli, uncontrollable temper, and general emotional instablity, minor lapses of memory, and a persistent insomnia. Diffuse, throbbing headaches, a not infrequent manifestation of bismuth intolerance, were consistently present.

The depressing influence of the bismuth therapy was clearly shown by the general symptoms of fatigue, weakness, and loss of weight. All the patients were physically below par, tired easily, and complained of persistent malaise, even while on rests from their regular occupations. Since this depressing effect is rarely observed when bismuth alone is given, it is reasonable to assume that it is due to the prolonged administration of both arsenic and bismuth. In case 5, however, and to a lesser degree in case 4, the arsenical factor in therapy, resulting in a toxic hepatitis, was in a large measure responsible for the general depressing effects.

Loss of appetite, a varying degree of chronic dyspepsia, and constipation, were present in all five patients. In cases 4 and 5 this was in part referable to specific liver damage from arsenic, but in the remainder, such involvement, if present, was subclinical. Nervous system hyperirritability, with sympathetic reflex changes, could not be eliminated as a factor in the gastro-intestinal stasis. There was no definite evidence of spasticity in the one patient in whom a barium study of the gastro-intestinal tract was made.

Three of the 5 patients were distressed by a chronic, non-productive cough. This occurred in the absence of signs of chronic bronchitis, and in no instance was there evidence of aneurysmal pressure. Chronic cough has been listed as a prominent symptom of bismuth intoxication.[3] Since there were no instances in which post-arsphenamine dermatitis developed, it seems unlikely that this cough could be due to exfoliation of the bronchial tree, as has occasionally occurred in extensive cutaneous eruptions due to arsenic. It may, of course, possibly represent a combined action of both arsenic and bismuth, or to some degree a secondary mild infection dependent on lowered general resistence.

Case 4 has been presented to illustrate toxic effects from both arsenic and bismuth, occurring in the absence of the typical symptom-complex presented by cases 1, 2, and 3. This patient suffered from a chronic dermatitis which was undoubtedly precipitated by the prolonged administration of bismuth. In this case, as in case 1, arsenical therapy did not play a part in the production of the cutaneous eruption, since both patch and intravenous tests to arsenic were without reactions. The previous excellent general health and splendid physique of this patient may have been a factor in the absence of other cumulative effects from the prolonged antisyphilitic treatment.

The important influence of the arsphenamines in the production of this syndrome is attested by the frequency with which other reactions specifically referable to arsenic developed. In case 1 an intercurrent herpes zoster occurred, while case 2 experienced severe nitritoid reactions, and delayed gastro-intestinal upsets accompanied by chills and fever. Case 3 developed a severe thrombocytopenic purpura, and cases 4 and 5 manifested evidence of severe liver damage. In addition, it should be recalled that the arsphenamines, when given in short courses and in relatively small dosage, have a well recognized tonic and non-specific stimulating effect. When large doses are given over prolonged periods, as was done in all five of the presented cases, the reverse is true, and the effect is one of chronic depression. Nervous irritability is undoubtedly an integral part of this depressive, or cumulative toxic action.

Three of the 5 patients presented above had inactive, latent syphilis. A fourth patient (case 5) developed muco-cutaneous relapse, but was grossly over-treated with arsenic in relatively huge dosage, 0.9 grams for a frail women weighing 98 pounds. The fifth patient had central nervous system involvement of the paretic type, which did not, of course, respond to standard antisyphilitic treatment. All of these cases exemplify the current medical trend of under-examination and over-treatment of the patient with syphilis. In latent syphilis particularly is the fetish of treatment carried to undesirable lengths. Until the practising physician makes a thorough initial investigation of every patient with a syphilitic infection before treatment is begun, until he asks himself what lies back of the positive Wassermann, and makes a creditable attempt to differentiate late, inactive latency from active visceral syphilis, such tragedies will continue to occur.

SUMMARY

1. Five patients, illustrating various phases of over-treatment for syphilis, have been recorded.

2. Three of these patients presented a well defined over-treatment syndrome, apparently due to prolonged therapy with trivalent arsphenamine and with bismuth.

3. This syndrome consists of symptoms referable to the nervous system, as manifested by nervous irritability, insomnia, and headaches; to the gastro-intestinal tract, as anorexia, chronic dyspepsia, and constipation; to the respiratory system, as a chronic cough; general weakness, malaise, and loss of weight.

REFERENCES

1. MOORE, J. E.: The Modern Treatment of Syphilis, C. Thomas, Baltimore, 1933, p. 126.
2. STOKES, J. S.: Modern Clinical Syphilology, Saunders, Phila., 2nd ed., 1934, p. 418.
3. LEFF, C.: Chronic intoxication with bismuth, *Military Surgeon*, 1932, 70: 456.

TUMOURS OF THE SPINAL CORD: DIAGNOSIS AND TREATMENT*

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THE frequent occurrence of primary intraspinal tumours, which are usually benign and operable, justifies a review of the symptoms produced and the newer methods employed in the differential diagnosis. The earlier intraspinal tumours are recognized, the less will be the damaging effects on the spinal cord and the more complete will be the recovery when the pressure has been relieved by the removal of the tumour.

The specific cause of tumours of the spinal cord remains unknown. However, the same factors probably pertain to the development of tumours within the cord and meninges as are responsible for tumours elsewhere. Intraspinal tumours rarely develop in childhood, and the youngest patient in our series was aged seven years, although congenital tumours have been reported to have occurred as early as the twenty-second month of life. The third, fourth, and fifth decades of life are the ages at which most of the tumours occur.

It is doubtful if trauma is a predisposing factor unless it is responsible for the development of osteomas, fibromas, and ecchondromas from the intervertebral disks.[18] Trauma, as well as chronic infection, may be responsible for hypertrophic osteitis, which produces radiculitis and slowly progressive myelitis, simulating the symptoms of intraspinal tumour.[24] In cases in which malignant tumours were present in some part of the body, metastatic growths have been

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reported to have occurred in the spinal column after injuries to the back.

Tumours arise from all of the primary tissues of the spinal canal.[1, 3, 11] They arise more frequently from the meninges and nerve roots than they do from the spinal cord and the supporting structures of the vertebral column. They are about equally distributed throughout the spinal canal. Meningiomas represent 50 per cent of the intraspinal tumours and neurofibromas, 25 per cent. Neurofibromas are not always limited to the nerve roots within the spinal canal. They often have the appearance of a dumbbell; one portion is situated within the spinal canal and produces pressure on the cord, while the lateral portion extends through the intervertebral foramen to the extravertebral structures. Those that arise in the cervical region are demonstrated by roentgenograms and palpation. The dumbbell neurofibromas[20] that arise in the thoracic portion of the cord frequently erode the vertebræ and portions of the ribs. Occasionally they may extend into the thorax and grow to a considerable size. Their removal frequently requires a two-stage operation. At the first stage the intraspinal portion is removed, while at the second stage the intrathoracic portion is removed by a thoracic surgeon.

The dumbbell neurofibromas of the lumbar and sacral regions produce an enlargement of the intervertebral foramen and extend into adjacent tissue. The bony erosion produced by these tumours is a smooth erosion without an infiltration of the tumour into the vertebræ.

The remaining 25 per cent include a variety of tumours that rise from the extradural structures, such as the extradural fat and blood vessels, and the laminæ, peduncles and bodies of the vertebræ.[17] The intradural tumours, other than the meningiomas and neurofibromas, arise from the spinal cord, blood vessels and filum terminale.[16] The primary tumours of the spinal cord are gliomas and ependymomas. It is not uncommon to find rather extensive ependymomas[15] in the lumbar and sacral regions; they arise from the filum terminale. The gliomas do not lend themselves to radical removal, while most of the ependymomas do. This is especially true of the ependymomas that originate in the filum terminale.

Although metastatic tumours occur in the spinal canal as lesions of the vertebræ, nerve roots and the cord they are not considered primary intraspinal tumours and are not included in this consideration, since an attempt to remove such a lesion is rarely justified.

Although protruded intervertebral disks represent a rather common intraspinal lesion responsible for root-pain, chiefly in the distribution of the sciatic nerve, they cannot be considered neoplastic, since they are composed of cartilage, fibrous tissue and mucoid tissue.

SYMPTOMS

Tumours which arise from the tissues surrounding the spinal cord have been designated as "extramedullary", in contrast to those which arise in the cord itself, which have been called "intramedullary". Oppenheim and Frazier have divided the symptoms of extramedullary tumours into three phases. The first phase is that of involvement of nerve roots[22]; the second, that of beginning compression of the spinal cord; and the third that of extreme compression of the spinal cord, producing the clinical picture of transverse section of the cord.

The outstanding symptom of involvement of nerve roots is pain, which is usually characteristic and pathognomonic.[10] It may precede any other symptoms by months or years; it may be constant or intermittent, persist in a localized region, and radiate over the involved nerves. It is usually lancinating, and is aggravated by coughing, sneezing, lifting, and straining at stool, and it invariably awakens the patient from four to six hours after he has retired. It often becomes so severe as to compel him to walk the floor or to sleep in a sitting position. The mechanism that produces this pain apparently is the ball-valve action of the tumour; which is forced downward by the increased pressure of cerebrospinal fluid above it, thus producing traction directly or indirectly on the nerve roots. Unfortunately, many of the patients are treated for neuritis, muscular rheumatism, or syphilis, and some have been thought to have had hysteria. The importance of recognizing or suspecting the first, or painful, phase in the development of tumours of the spinal canal was emphasized in a recent survey by Craig,[8] in which 10 per cent of the patients who had root pain had been operated on for some thoracic or abdominal lesion other than an intraspinal tumour.

When the tumours occur in the cervical region of the cord the pain may be localized in the neck or extend to the occiput or to the shoulders, de-

pending on the localization of the growth. It is increased by laughing, sneezing or coughing, and may be accompanied by some rigidity of the neck. Tumours in the thoracic region produce pain which frequently simulates intercostal neuralgia, cholecystitis or cholelithiasis, renal colic, or even appendicitis. Tumours of the cauda equina and the filum terminale in the lumbar and sacral regions give rise to pain which simulates sciatica. Again, the pain may persist for months before signs of compression are manifest. Rupture of the intervertebral disk, with prolapse of the nucleus pulposus in the lumbosacral region, according to Love and others, is also characterized by symptoms of chronic recurring sciatica.

The symptoms which develop in the second symptomatological phase, the phase of beginning compression of the spinal cord, differ from those of the first phase in that neurological evidence of compression of the cord now becomes evident. The symptoms may develop simultaneously with the existence of pain,[8] or they may develop without pain in a small percentage of cases. If the tumour is situated anterolaterally the symptoms will progress and produce the Brown-Séquard syndrome, a homolateral paralysis of the muscles below the level of the lesion, with impairment of tactile and deep sensibilities on the same side, together with loss or diminution of pain and temperature on the opposite side. If the posterior columns of the cord are the first to be compressed by the tumour the deep sensibility is decreased and ataxia appears. Sensory disturbances resulting from compression of the cord are gradual in onset, and progress upward to a transverse level corresponding to the segment of the cord that is compressed.

At the lower end of the spinal cord other difficulties may be encountered. The relative shortening of the cord incident to growth, and the emergence of the roots through the anterior foramina of the sacrum often make it extremely difficult to determine whether there is a tumour of the conus medullaris, of the cauda equina, or of the sacrum. The objective findings may be the same. In this group studies with lipiodol are valuable in localizing and differentiating the lesion. Paralysis below the level of the tumour comprises the third symptomatological phase, and is caused by extreme compression of the cord.[7] The paralysis is usually complete, sensory functions are entirely lost, trophic disturbances are present, and there is definite loss of control of both vesical and rectal sphincters.

Intramedullary tumours rarely produce pain, but pass directly into the second symptomatological phase. The sensory and motor disturbances are progressive until a definite transverse level becomes evident. The upper sensory level is less distinct than that produced by extramedullary tumours. Increased reflexes and loss of vesical and rectal control appear early in the symptom-complex.

EXAMINATION

The symptoms which play important parts in the diagnosis of intraspinal lesions emphasize the necessity of a comprehensive history in all cases. Following the taking and recording of the history, a detailed general, as well as a neurological, examination is necessary. These examinations should include such special features as spinal puncture, Queckenstedt studies, and roentgenograms of the spinal column, with or without the introduction of iodized oil.

Neurological examination. — In the case in which tumour of the spinal cord is suspected there is no investigation so important as complete neurological examination. The information elicited by a detailed testing of reflexes, muscular strength, muscular tonus, sensory acuity, gait, coordination, and balance tends to distinguish between degenerative diseases and compression of the cord.

Spinal puncture.—This examination is very important, because it reveals information concerning the physical properties and the hydrodynamic properties of the spinal fluid, and allows its chemical reactions to be determined.[2] The puncture is usually performed at the fourth lumbar interspace, and before any fluid is removed the intraspinal pressure is estimated by means of Ayer's water manometer, which normally registers between 12 and 15 cm. As soon as the pressure has been estimated Queckenstedt's test is made. This consists of reading and studying the rate of rise of the cerebrospinal fluid in the manometer following compression of both internal jugular veins. Sudden rise and rapid fall of the fluid on compression of both internal jugular veins indicate free flow of cerebrospinal fluid within the subarachnoid space. Slow rise and fall of fluid or its failure to rise on compression of the jugular veins suggest partial or complete intraspinal block.

Inability to obtain fluid at the fourth lumbar interspace may signify that the tip of the needle has failed to enter the subarachnoid space, that fluid is absent, or that there is a tumour at this level. Puncture should be made at another level, and it may be necessary to make multiple punctures. Occasionally, it is necessary to combine cisternal puncture with lumbar puncture.[4]

Spinal block, if it results from tumour, frequently causes an increase in the concentration of globulin in the cerebrospinal fluid below the tumour. The fluid may also be xanthochromic[9] (Froin's syndrome[13]). The shade of yellow may vary, and occasionally the fluid above a block is decidedly yellow. The cell count is usually normal, but pleocytosis may occur if the tumour is situated in the spinal canal below the conus medullaris. This may help in distinguishing neoplasms from inflammatory lesions.

The presence of partial or total subarachnoid block is not pathognomonic of intraspinal tumour, since previous attacks of meningitis, acute myelitis, injuries to the vertebræ, or spinal deformities are all capable of interfering with the free flow of cerebrospinal fluid. It is, however, apparent that the finding of partial or total block is extremely valuable in diagnosis when the block is accompanied by a history of root pain, and with a negative history of inflammation or trauma of the spinal cord.

Roentgenographic examination. — Roentgenograms should be made of anteroposterior and lateral aspects of the vertebral column.[14] These should be supplemented by stereoscopic and oblique views, localized at the level where, on clinical grounds, a tumour has been suspected. According to Camp and me,[6] evidence of erosion of the vertebral pedicles, laminæ, and lateral and spinous processes caused by pressure usually is discernible before such erosion is evident in the body of the vertebræ. In general, roentgenological evidence of changes resulting from tumours of the spinal cord consists of shadows indicative of erosion secondary to direct pressure, invasion by the tumour, destruction caused by benign or malignant tumour of the bone, metastatic disease and hyperostosis.[5]

"The benign tumours of the vertebræ include osteomas, osteochondromas, chondromas, fibrochondromas, giant-cell tumours, and hæmangiomas.[23] All of these, which may involve the spinal cord by compression, have the same roentgenological effects on the vertebræ as they have on other portions of the skeleton. Giant-cell tumours usually involve the bodies of the vertebræ, although the bony processes are not uncommonly affected. This multilocular cystic lesion, primarily in the vertebræ, should be readily distinguished from localized erosion caused by a benign tumour of the spinal cord. Collapse of a vertebra produced irregular absorption and thickening of the trabeculæ of the bone, giving its structure a coarse, honeycombed appearance.

"Study with radiopaque oil.—In addition to the roentgenologic evidence of tumours which is apparent in routine examination of the spinal column, fluoroscopic and roentgenographic study by the use of radiopaque oil has furnished much additional information in diagnosis and localization of intraspinal tumours. Injection of 5 c.c. of iodized oil into the subarachnoid space, either through cisternal puncture or lumbar puncture, allows visualization under the fluoroscope of the patency or lack of patency of the subarachnoid space. Fluoroscopic examination of the slowly moving oil is superior to examination of a roentgenogram, since the roentgenologist often sees the diversion of the current of oil around the tumour. However, roentgenograms should be made for confirmation of the levels where tumours are suspected to be. Intramedullary tumours are identified by division of the oil into two currents, one on each side of the cord. Use of the heavier oils avoids their ascent into the cisterns and ventricles. Because introduction of these oils invariably produces irritation of the meninges, and occasionally radiculitis, they should be used only to localize tumours definitely. After the oil has been injected, the patient should be placed prone on the fluoroscopic table, and the flow of oil should be observed when he is in various positions, from horizontal to perpendicular. Experience with the use of radiopaque oil in the diagnosis of tumour of the spinal cord has indicated that oil should be used infrequently, only when tumours are suspected, and that the oil should be removed at operation whenever possible. The presence of extramedullary tumours usually is indicated by definite arrest of the flow of lipiodol. If there is no tumour or compression of the cord the oil descends and remains permanently in the sacral cul-de-sac."

DIFFERENTIAL DIAGNOSIS

The symptoms of metastatic lesions may be the same as those of any benign tumour of the spinal

cord, except that the progress of malignant growth is usually more rapid. Metastatic growths from *carcinomas of the breast* or prostate gland are most frequent. It must not be forgotten that a primary carcinoma of the breast may have been removed many years before metastasis gives evidence of its presence. Since *carcinoma of the prostate gland* may not produce local symptoms rectal examination should be made as a routine. Among the various diseases that may be difficult to distinguish from tumour is *hypertrophic pachymeningitis.* In this disease, the dura becomes thickened, usually in the cervical region. This thickening pinches off the nerve roots, and causes pain, atrophy, and sensory disturbances of the arms and hands; by compressing the cord it causes impairment of function below the lesion. The condition, *meningomyelitis,* may remain localized. There is often a history of antecedent trauma or infection. As a rule, examination does not disclose a Brown-Séquard syndrome; the upper level of anæsthesia is usually indistinct, and all qualities of sensation are equally affected, possibly because the inflammation penetrates the cord.

The spinal column itself may be the seat of the original disturbance. Compression of the cord is not uncommon in *Pott's disease.* A somewhat infrequent cause of compression is *chronic hypertrophic osteo-arthritis* of the spinal column, of which the roentgenogram often fails to give evidence. *Spondylolisthesis,* or a slipping forward, usually of the fifth lumbar vertebra on the sacrum, often results in injury to the cauda equina. Occasionally, a case of *Paget's disease* is encountered in which the cord shows evidence of compression. A tumour may be superimposed on spina bifida. The difficulty lies in the fact that the symptoms of spina bifida may be late in appearing, presumably on account of traction on the cord and nerve roots which are anchored below. Spindle-legs, deformity of the feet, an area of sacral hypertrichosis, and a sacral dimple are useful signs.

In cases of *subacute combined degeneration of the spinal cord,* the lesion, although progressive, is usually painless and diffuse. The diagnosis of *locomotor ataxia* is sometimes erroneously made, when the real cause of the symptoms is a tumour of the spinal cord or cauda equina. It may be difficult to distinguish *syringomyelia* from intramedullary tumour. However, in the presence of the former the following usually aid in establishing the correct diagnosis: the characteristic waistcoat type of sensory disturbance, with a predilection for involvement of the pain and temperature fibres, since these lie near the central canal, and the local atrophy caused by extension of the process here and there into the anterior horns. If a tumour of the cord is associated with syringomyelia the diagnostic difficulties may be insurmountable.

Although *multiple sclerosis* may produce a transverse lesion of the cord, the youth of the patient, the absence of pain, and the presence of cerebral signs, such as tremor, scanning speech, nystagmus, optic atrophy, ocular palsy, and the characteristic emotional lability, usually put the diagnostician on guard.

Since *protruded intervertebral disks,* with or without rupture[19] and prolapse of the nucleus pulposus, occur chiefly in the lumbosacral region the characteristic symptoms are those of recurring sciatica. Occasionally, a protruded disk may result from injury to the sixth and seventh cervical disks.[21] When this occurs the symptoms are those of brachial neuritis, and if a prolapse of the nucleus pulposus has taken place the symptoms of brachial neuritis will be accompanied by signs of compression of the cord. The symptoms of chronic sciatica which continue to recur and fail to be relieved by the eradication of foci and physiotherapy are invariably due to the protrusion of the intervertebral disk into the spinal canal with compression of the third, fourth or fifth lumbar roots on one or both sides. A careful survey of the history will invariably reveal a history of trauma. The trauma may be the result of a fall, a hyperanterior flexion of the spinal column, or a sudden strain in lifting a heavy object. A positive Lasègue sign and a diminished or lost Achilles reflex are frequently the only neurological findings. The spinal fluid usually is normal, except for the occurrence of an increase in the protein content. A roentgenographic study with radiopaque oil often is necessary before a definite diagnosis can be made. When a lesion is present a definite filling defect can be demonstrated by roentgenoscopic or roentgenographic examination. My experience has been that the best relief is obtained by a removal of the protruded portion of the intervertebral disk by a laminectomy. Rarely is a bone graft indicated following a laminectomy. The sudden relief of symptoms is dramatic. Occasionally tenderness corresponding to the

root involved may persist for two or three months, but restitution invariably takes place. Hypertrophied ligamentum flavum occasionally produces a filling defect in the column of opaque oil. The removal of a thickened ligamentum flavum does produce some relief of symptoms, but the results are not so definite as they are when the protruded portion of the disk is responsible for the chronic recurring sciatica.

SURGICAL TECHNIQUE

The technique of a laminectomy has become standardized, and therefore a detailed description is unnecessary.[12] The anæsthetic method I have found most suitable, after employing a variety of them, is that in which the ether is dropped onto an open mask which is held over a Magill intratracheal tube. The intratracheal tube is introduced as soon as the patient has been anæsthetized with nitrous oxide and ether. In proceeding with a laminectomy one should make sure of the localization of the lesion, and bear in mind that unless the lesion has been localized by a roentgenogram the cord levels are situated above the corresponding osseous segments. A subperiosteal elevation of the periosteum and muscles will result in less bleeding than a lateral reflection of the erector spinæ muscles by sharp dissection. Extreme care should be taken in removing the laminæ from the tumour, in order to avoid additional trauma to the cord. The surgeon should also have in mind that dural pulsations will be detected above the tumour but will be absent below it, since this observation will direct him in extending the laminectomy in the proper direction in order to expose and remove the growth properly. Many tumours, like the meningiomas, can be removed *in toto*, but occasionally it becomes necessary to resect and remove them piecemeal in order to avoid trauma to the spinal cord and blood vessels. It occasionally is necessary to remove wide portions of the dura with the tumour, since recurrences will follow if tumour cells are left on the dura. It is not necessary to attempt a plastic closure of dural defects. The application of animal membrane or Cargile membrane over the dural defect is of value in preventing blood from entering the subdural and subarachnoid spaces. Extreme care should be taken in controlling hæmostasis. Electro-coagulation is of great value in controlling hæmorrhage from the meninges and soft tissues within the laminectomy wound. Rarely is it necessary to employ drainage. The muscles and fascia are closed with interrupted sutures of No. 1 chromic catgut. The fascia, subareolar tissue, and skin are sutured with interrupted silk sutures.

POST-OPERATIVE CARE

Following the operation the patient is placed in bed in the lateral position on pillows, to avoid undue pressure on the tips of the shoulders and hips.[25] It is preferable to turn the patient from side to side and on the abdomen rather than to allow him to lie on his back, as sweating may result in maceration of the skin and contamination of the wound, and may interfere with primary union. The patient otherwise is treated as is the average surgical patient. If urinary incontinence is present it is safer to insert an indwelling catheter rather than to repeat catheterization daily. The former procedure tends to prevent cystitis. This catheter should be changed every four or five days, and the bladder should be irrigated twice daily with an antiseptic solution. A urinary antiseptic, such as sodium acid phosphate and methenamine, is administered as a precaution against ascending pyelonephritis. Usually, daily doses of mineral oil combined with milk of magnesia are administered to prevent distension from fæcal impaction. In addition a daily enema is necessary. The patient is kept in bed for two weeks, when he is permitted to sit in the upright position in bed; he subsequently is allowed to be taken about in a wheel chair and to walk if possible. The usual post-operative course continues for three weeks. Physiotherapy is advised if muscular cramps and motor weakness exist. Indwelling catheters should be permanently removed when the patient has recovered sufficient control of the bladder to empty it thoroughly.

Contractures and defensive reflex spasms are corrected and relieved during the period of convalescence by the application of Buck's extension to the feet and legs while the patient is in the reclining position. The recovery of motor, sensory, vesical, rectal and sexual functions takes place in the reverse order of their previous disappearance.

SUMMARY

Primary intraspinal tumours are usually benign, occur much more frequently than is usually thought, and 80 per cent are operable. With recognition of the characteristic root-pain syndrome, and with the aid of spinal puncture and roentgenographic studies, it is possible to recognize intraspinal tumours before compression of the cord results. After symptoms of compression have developed a successful removal of an intraspinal tumour usually will result in a complete recovery. It is imperative to make a careful investigation of every patient who presents symptoms of root pain or compression of the cord rather than to wait until he is paralyzed.

REFERENCES

1. ADSON, A. W.: Surgical Diseases of the Spinal Cord. In Surgical Diagnosis, Saunders, Philadelphia, 1930, vol. 3, p. 899.
2. *Idem*: The diagnosis and treatment of surgical lesions of the spinal cord, *Proc. Interstate Postgrad. Med. Ass. N. Am.*, 1935, p. 125.
3. ADSON, A. W., KERNOHAN, J. W. AND WOLTMAN, H. W.: Cranial and cervical chordomas: a clinical and histologic study, *Arch. Neurol. & Psychiat.*, 1935, **33**: 247.
4. AYER, J. B.: Spinal subarachnoid block as determined by combined cistern and lumbar puncture with special reference to early diagnosis of cord tumour, *Arch. Neurol. & Psychiat.*, 1922, **7**: 38.
5. CAMP, J. D.: The significance of caseous changes in the roentgenographic diagnosis of tumours of the spinal cord and associated soft tissues, *Radiology*, 1934, **22**: 295.
6. CAMP, J. D. AND ADSON, A. W.: Roentgenologic findings associated with tumours in the spinal canal, *Proc. Staff Meet. Mayo Clinic*, 1931, **6**: 726.
7. CRAIG, W. McK.: Spinal cord compression: tumours and allied non-traumatic conditions, *Am. J. Surg.*, 1931, **12**: 303.
8. *Idem*: The pain of tumours of the spinal cord, *West. J. Surg.*, 1932, **40**: 56.
9. CUSHING, H. AND AYER, J. B.: Xanthochromia and increased protein in the spinal fluid above tumours of the cauda equina, *Arch. Neurol. & Psychiat.*, 1923, **10**: 167.
10. ELSBERG, C. A.: Tumours of the Spinal Cord and the Symptoms of Irritation and Compression of the Spinal Cord and Nerve Roots, Hoeber, New York, 1925.
11. FLETCHER, E. M., WOLTMAN, H. W. AND ADSON, A. W.: Sacrococcygeal chordomas: a clinical and pathological study, *Arch. Neurol. & Psychiat.*, 1935, **33**: 283.
12. FRAZIER, C. H. (with the collaboration of A. R. Allen): Surgery of the Spine and Spinal Cord, Appleton, New York, 1918.
13. FROIN, G.: Inflammation méningée avec réactions chromatiques, fibrineuses et cytologiques du liquide céphalo-rachidien, *Gaz. d. hôp.*, 1903, **76**: 1005.
14. HAMPTON, A. O. AND ROBINSON, J. M.: The roentgenographic demonstration of rupture of the intervertebral disc into the spinal canal after the injection of lipiodol, with special reference to unilateral lumbar lesions accompanied by low back pain with "sciatic" radiation, *Am. J. Roentgenol.*, 1936, **36**: 782.
15. HORRAX, G.: A report on removal of extensive ependymoma. (Unpublished data).

16. KERNOHAN, J. W.: Primary Tumours of the Spinal Cord and Intradural Filum Terminale. In Cytology and Cellular Pathology of the Nervous System, Hoeber, New York, 1932, vol. 3, p. 991.
17. KERNOHAN, J. W., WOLTMAN, H. W. AND ADSON, A. W.: Intramedullary tumours of the spinal cord: a review of fifty-one cases, with an attempt at histological classification, *Arch. Neurol. & Psychiat.*, 1931, **25**: 679.
18. LOVE, J. G. AND CAMP, J. D.: Root pain resulting from intraspinal protrusion of intervertebral discs: diagnosis and surgical treatment, *J. Bone & Joint Surg.*, 1937, **19**: 776.
19. MIXTER, W. J. AND BARR, J. S.: Rupture of the intervertebral disc with involvement of the spinal canal, *New Eng. J. M.*, 1934, **211**: 210.
20. NAFFZIGER, H. C. AND BROWN, H. A.: Hour-glass tumours of the spine, *Arch. Neurol. & Psychiat.*, 1933, **29**: 561.
21. NAFFZIGER, H. C., INMAN, V. AND SAUNDERS, J. B. DEC. M.: Lesions of the intervertebral disc and ligmenta flava, *Surg., Gyn. & Obst.*, 1938, **66**: 288.
22. PARKER, H. L. AND ADSON, A. W.: Compression of the spinal cord and its roots by hypertrophic osteoarthritis, *Surg., Gyn. & Obst.*, 1925, **41**: 1.
23. PENFIELD, W.: The encapsulated tumours of the nervous system: meningeal fibroblastomata, perineural fibroblastomata and neurofibromata of von Recklinghausen, *Surg., Gyn. & Obst.*, 1927, **45**: 178.
24. STOOKEY, B.: Compression of the spinal cord due to ventral extradural cervical chondromas: diagnosis and surgical treatment, *Arch. Neurol. & Psychiat.*, 1928, **20**: 275.
25. WOLTMAN, H. W. AND ADSON, A. W.: Abscess of the spinal cord: report of a case with functional recovery after operation, *Brain*, 1926, **49**: 193.

THE INVESTIGATION OF THE JAUNDICED PATIENT*

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IN the investigation of a jaundiced patient from a surgical point of view we must put forth every effort to distinguish *intrahepatic* jaundice from *extrahepatic* jaundice. The former is a medical problem, the latter, a surgical problem.

From a clinical point of view jaundice may be considered as consisting of three main types: (1) hepatogenous; (2) hæmatogenous; (3) obstructive.

HEPATOGENOUS JAUNDICE

Hepatogenous jaundice, or intrahepatic jaundice, should be a purely medical problem, as surgery has nothing to offer for its relief. From a surgical point of view, however, we must be prepared to recognize conditions where our services would be of no avail, because of damage to the liver cells, as in intrahepatic jaundice. We must differentiate simple catarrhal jaundice, acute and chronic hepatitis, toxic states, and effects of drugs.

The *toxic states*, such as toxæmia of pregnancy (eclampsia), thyrotoxicosis, etc. should come into mind. *Drugs* as the toxic agents may be a puzzle; anti-rheumatic medicines containing cinchophen, and antiluetic arsenicals, and now sulphanilamide, are outstanding offenders. Bacteriological studies are also necessary to exclude *yellow fever* and *Weil's disease*. Even carrots in abundance may produce a jaundice (carotenæmia).

HÆMATOGENOUS JAUNDICE

Surgically, the hæmatogenous type is limited to practically one condition, and its three names help to bring to mind the three outstanding points in the diagnosis, namely, *familial jaundice*, or *hæmolytic jaundice*, or *acholuric jaundice*, *i.e.*, (1) It is a lifelong condition transmitted through members of the same family. (2) Fragility of the red blood cells, when placed in hypotonic saline solution; also a microcytosis and reticulocytosis. (3) Bilirubin is absent in the urine and the stools are not clay-coloured. The liver and spleen are usually enlarged but smooth.

Warning.—Cholecystography might point to a non-functioning gall bladder, or even stones, but, as Griffin has pointed out, although 58 per cent of cases have stones as an added attraction, we must not be misled by the picture, as an attack on the gall bladder will not relieve the jaundice, but splenectomy will.

Routine jaundice investigation.—In hæmolytic jaundice the van den Bergh reaction is persistently indirect, with two exceptions: (*a*) where hæmolytic jaundice becomes obstructive in the common bile duct due to extreme viscosity of the bile; (*b*) where pigment stones in addition get into the common bile duct and produce obstruction.

Serum bilirubin shows a slight increase up to 10 mg. per 100 c.c. of blood.

Duodenal drainage shows a free flow of bile and is of no value.

Splenectomy will cure familial jaundice, and is at its best in children where there is not so much as an icteroid tint after three weeks.

OBSTRUCTIVE JAUNDICE

Obstructive jaundice is due to (1) calculus, (2) cicatrix, (3) cancer. In obstructive lesions

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all have bilirubinuria (bile); all have an increase in concentration of serum bilirubin; all have direct positive van den Bergh reactions.

1. *Calculus.*—Here we have the history of typical gall-stone colic with sudden onset, severe pain, relieved only by morphine.

Routine investigation. — The duodenal tube usually brings forth a fairly free flow of bile, but on repeated daily attempts the amount will fluctuate; the presence of cholesterol, plus calcium bilirubinate crystals, is pathognomonic of calculus.

Examine the stools daily with the gloved finger, and the pigmentation of the stool will likely vary if the obstruction be a stone.

Bile pigment is present in the urine, and bile salts can be demonstrated (urobilinogen and urobilin vary according to the amount of bile pigment which enters the intestine).

The amount of serum bilirubin in 100 c.c. of blood, when estimated daily over a given period, will be seen to fluctuate if a graph be plotted out if the obstruction be a common duct stone. That is, colic is followed by a sharp increase in the amount of serum bilirubin, whereas if the obstruction is released an equally sudden decline occurs. The surgical risk seems to be at its lowest with a stationary or rapidly falling curve of bilirubin, and is of considerable value in selecting the most favourable time for operative interference.

2. *Cicatrix.*—Scars or strictures producing common-duct obstructions have the history of trauma, and practically all are the result of former operations, and if that former operative procedure has been cholecystectomy, I know of no more serious problem in the field of abdominal surgery that can confront any surgeon.

If a biliary fistula has established itself, the injection of an opaque solution into the fistulous tract may direct us to the location of the stricture by making use of the x-ray.

Routine investigation. — The duodenal tube proves the flow of bile to be persistently scanty. Pigmentation of the stools is slight, if any, and light clay-coloured stools are constant.

Bilirubinuria is constant.

The amount of serum bilirubin in the blood, when a graph is plotted out covering several daily estimations, shows a fixed low curve. This is because biliary cirrhosis develops, and may be followed by chills and fever in the late stages.

3. *Cancer,* or neoplasms of such types as adenomata at the ampulla of Vater or mouth of the pancreatic duct, or papillomata produce obstructive jaundice. *Note.*—In 2,500 autopsies reported by Shapiro carcinoma of the extrahepatic bile ducts was three times as frequent as cancer of the head of the pancreas. The onset is gradual, the course persistent and progressive, and may be confusing if correlated with the history of colics and the presence of stones—(25 per cent of all mothers have stones, and practically all primary carcinomas of the liver show stones). *Courvoisier's law* states that a palpable gall bladder and jaundice meant obstruction due to cancer, and it is almost 100 per cent correct.*

Routine investigation.—The duodenal tube in carcinomatous obstructions does not withdraw any bile.

The stools remain constantly clay-coloured on daily investigations with the gloved finger. Rectal digital examination can then exclude rectal cancer, and exclude the possibility of the jaundice being due to metastatic liver involvement; the right and left colons can usually be palpated with the same idea in mind. The rectal shelf can be explored at the same time for evidence of adenopathy, where carcinoma of the stomach might be the primary lesion with extension into, or metastatic involvement of, the liver as a cause of jaundice.

Bilirubinuria is constantly present in all obstructive lesions.

A secondary anæmia with macrocytes is frequently found in the smear. Since carcinoma usually produces complete obstruction, high and rising curves of serum bilirubin per 100 c.c. of blood are the usual results where daily estimations are made and graphs plotted out.

To recapitulate,—a comparison of the curves of serum bilirubin is as follows; the calculus obstructions have a fluctuating curve; the cicatrix obstructions have a fixed low curve; the carcinomata have a rising high curve.

Hydrohepatosis results if the obstruction be not removed and is followed by infection of the parietal sacculi, and then deep involvement of the hepatic parenchyma. Rapid recovery from this condition will occur if the removal of the

* To palpate a gall bladder more definitely give from gr. 1 ss to iii of nembutal, then a hot bath, and see the ease with which one can feel through the abdominal wall.

obstruction is not too late, but the two barriers to successful surgery in the attempt to relieve the jaundice are hepatic insufficiency and hæmorrhage.

(*a*) *Liver function tests* are of value surgically,— (1) to establish or confirm a diagnosis made on clinical grounds; (2) to warn off operative or post-operative complications; (3) to indicate the risk of the operation.

The van den Bergh test when described as "direct positive" indicates jaundice due to mechanical obstruction, and is a "go" sign for surgery, except where there is severe intrahepatic damage. The only time an indirect van den Bergh indicates operation is in familial jaundice, and then traffic is directed to the spleen and not the biliary ducts.

The glucose tolerance test.—(First prove that the patient is sugar free). Forty grams of glucose are given on a fasting stomach and the urine saved hourly for 5 hours. Normally, less than 3 grams reduce sugar; 6 grams, bad.

The hippuric acid test.—Give 6 grams of benzoic acid fasting and save the urine hourly for 4 hours and estimate the hippuric acid output. Normally more than 3 grams are excreted, but it is thought that where 1.5 grams or less are excreted severe liver damage is present and then the surgical risk is too great. Benzoic acid normally acts on glycine, which is normally manufactured in the liver, and hippuric acid results by a process of synthesis.

The hippuric acid test corresponds with the degree of serum bilirubin in a general way, as seen by the accompanying table, but there is very little correlation of the excretion of galactose and the synthesis of hippuric acid. This table was worked out by my partner, Dr. J. E. Plunkett, from cases representing the three types of obstructive jaundice.

TABLE I.

RESULTS OF LABORATORY TESTS IN CASES OF OBSTRUCTIVE JAUNDICE

Cause of obstruction	*Case*	*Benzoic acid test, g.*	*Serum bilirubin, mg. per 100 c.c.*	*Dye retention grade*	*Galactose tolerance test, g.*	*Remarks*	
Stone	27	0.00	12.0		0	Stone in common bile duct; patient jaundiced one year and in poor condition.	Bad risk.
	28	2.09	2.0	3		Stone in common bile duct; recent colic.	Fair risk.
	29	3.10	1.8		0	Stone in common bile duct; marked hepatitis; patient convalescing.	Good risk.
Stricture	30	1.30	3.8	1	3.00	Stricture of common bile duct; biliary cirrhosis.	Bad risk.
	31	1.58	5.8		5.31	Stricture of common bile duct; biliary cirrhosis; external biliary fistula.	Fair risk.
	32	1.83	7.5		2.10	Stricture of common bile duct; biliary cirrhosis.	Fair risk.
	33	2.20	3.1		0	Stricture of common bile duct.	Good risk.
Carcinoma	34	0.50	12.8		0	Carcinoma of pancreas; marked cirrhosis.	Very bad.
	35	0.52	22.1			Carcinoma of ampulla of Vater; marked cirrhosis.	Very bad.
	36	2.45	14.6		0	Carcinoma of pancreas; hepatitis and cholangeitis.	Fair if not "carcinoma" of pancreas.
	37	2.65	12.3		0	Carcinoma of pancreas; liver in fair condition.	Fair if not "carcinoma" of pancreas.
	38	2.90	3.5	2		Carcinoma of pancreas (early).	Good if not carcinoma of pancreas

(*b*) *Hæmorrhage,* as a barrier to operation in jaundiced patients, calls for an estimation of bleeding time, clotting time, and prothrombin time.

The prophylactic measures used include intravenous calcium chloride, repeated blood transfusions, and vitamin K. The first two have undoubtedly been of help, but physiologists now feel that they have something in vitamin K. It is now known that hæmorrhage is due to a deficiency of prothrombin, and this in turn is due to lack of absorption of its precursor vitamin K, and vitamin K is not absorbed when bile is lacking in the intestine.

TABLE II.

HOW TO INVESTIGATE A CASE OF JAUNDICE

History:

1. Family incidence.
2. Neighbourhood cases.
3. Age and sex.
4. Preceding health — indigestion, cramps, colic, flatulency, jaundice, other illnesses, typhoid, pregnancy, exophthalmic goitre.
5. Medication—cinchophen (rheumatism medicines). arsenic (lues).
6. Onset—slow or rapid.
7. Pain—present or absent.
   Type, location, radiation, time in relation to meals.
8. Duration.
9. Course—persistent or intermittent.
10. Associated—chills and fever, loss of weight, pruritus.
11. Colour of the urine and stools.

General Examination:

1. Colour or shade of skin.
2. Evidence of wasting.
3. Scratch marks (pruritus?).
4. Size of spleen.
5. Size of liver—smooth? nodular?
6. Palpability of gall bladder (hot bath and nembutal).
7. Abdominal masses—in region of head of pancreas; in other organs; in peritoneum.
8. Ascites?
9. Colour of urine and stool (gloved finger if necessary).
10. Rectal examination.

Liver Function Tests:

1. Van den Bergh reaction.
2. Galactose tolerance test.
   Give 40 grams galactose fasting; save the urine for 5 hours.
   Normally less than 3 grams reduces sugar.
3. Hippuric acid test.
   Give 6 grams of sodium benzoate fasting.
   Collect the urine for 4 hours and estimate the hippuric acid.
   Normally more than 3 grams excreted.

Laboratory Tests:

1. Van den Bergh reaction.
2. Serum bilirubin—estimate daily and plot a curve.
   Above 30 mg. per 100 c.c. suggests intrahepatic jaundice.
   Above 15 mg. per 100 c.c. suggests an intrahepatic element in the jaundice.
   Rising curve—prognosis doubtful, delay operation.
   Falling curve—prognosis better.
   A fluctuating curve suggests calculus.
3. Stools for bile—daily, to determine if constant or intermittent.
4. Urine for (*a*) bile, (*b*) urobilin and urobilinogen.
5. Cholecystogram.
6. Duodenal drainage—several tests are best done.
   1. For presence or absence of bile.
   2. For presence of cholesterol and calcium bilirubinate crystals (calculus).
7. Usual temperature and pulse. Blood Wassermann test; white blood cells, etc.
8. Bleeding and coagulation time.
9. Special bacteriological studies, *e.g.*, for yellow fever, Weil's disease.
10. Fragility and size of red blood cells.

PSYCHOGENIC DISORDERS IN CHILDHOOD WHICH SIMULATE ORGANIC DISEASE*

BY WILLIAM A. HAWKE, M.D.(TOR.), M.R.C.P.(LOND.)

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THE pædiatrician is frequently confronted by children whose complaints arise from either structural changes due to organic disease or from disturbances in function without such structural alterations. These disturbances of function are due not to trauma, infection or new growth but to mental, emotional or social factors which affect the developing child. It is the intention of this article to discuss these factors and their attendant problems. Special attention will be paid to those psychogenic disturbances which simulate organic disease and are often a difficult problem in diagnosis.

ETIOLOGY

These psychogenic disorders do not arise in happy, well-adjusted children, nor do they arise spontaneously in normal children. In every individual there has been some frustration, dissatisfaction, or loss of security which has led to the presence of these abnormal symptoms. The causal factors may be quite apparent or may be discovered only after adequate psychiatric investigation. These factors are almost infinite in their varieties but may be grouped into two types—those which arise from the inherent characteristics of the individual and those arising from his environment. Those factors which are an integral part of the individual may be further divided into:

1. *The intellectual factor.*—The child of inferior intelligence is often beset with problems. He finds it hard to learn social customs, school work is more difficult for him, and, to add to his worries, his parents seldom understand him and

* From the Department of Pædiatrics, University of Toronto, and the Hospital for Sick Children, Toronto, under the direction of Alan Brown, M.D., F.R.C.P.(C.).

continually nag and push him in an attempt to obtain results. It is difficult for him to fit into the community and he often creates many unsatisfactory situations. The child of superior intelligence may also be a problem, because he has too much leisure time and does not find enough challenge in his daily routine. He develops faulty habits and becomes dissatisfied with school or home.

2. *The physical factors.*—Some children are fatigued through focal infection and their usual behaviour completely altered. Some suffer from chronic or deforming illnesses which limit their activities and set them apart from other children. They find it difficult to make a satisfactory adjustment to life, and may become quiet and recessive, or, on the other hand, overactive and aggressive. Too much attention in the course of any illness leads to problems, and the child may become a source of trouble to the household through his constant attempts to obtain attention and power after the illness is over.

3. *The emotional factors.*—There are the problems seen in the timid sensitive child who shrinks away from unpleasant situations and who in later life may show schizoid tendencies; there are those seen in the aggressive child with temper tantrums and storms of anger who battles away and attempts to dominate the family. The jealous child, bickering and quarrelling with his siblings, seeking continual favouritism and disrupting the home, is a frequent cause of family discord.

4. *The constitutional or hereditary factors.*—It is doubtful if such an extra division is necessary as these usually show in the emotional, physical, or intellectual life of the individual. Alcoholics, psychotics, or neurotics are not likely to breed stable children, for as the parents sought refuge in abnormal reactions, so will the children.

The factors contained in the environment may be arranged under the following headings.

1. *The parents.*—They are of the utmost importance; they may be cruel or brutal, quarrelsome or alcoholic. There may be separation, death or divorce, or rejection of one child with partiality shown to others. There may be chronic ill-health with its attendant problems and examples. On the opposite side are the over-indulgent and over-solicitous parents producing a different but definite series of problems in their children.

2. *The family.*—The reaction of the child to the rest of the family, to his brothers, sisters, or grandparents is important. There may be again actual cruelty or neglect; he may feel inferior to his siblings, or he may have difficulty in adjusting to the arrival of a younger child. On the opposite side, the only child, or the youngest child in a large family, is often a constant source of trouble.

3. *The home.*—There is a great variation in the homes of problem children. There may be poverty, poor sleeping accommodation, insufficient clothing, or actual lack of food. On the other hand, abundance often leads to an unhappy future when every wish of the child is gratified.

4. *The neighbourhood.*—Due to unsuitable surroundings and inadequate recreational facilities the child may be forced into gang activities, with the attendant problems of lying, stealing and sexual misconduct. Frequent changes of residence may prevent him from building up friendships or community interests. The isolated child living in a community with excellent resources, but few children to play with, has his own definite problems.

5. *The school.*—For most children school is the first contact with authority outside the home. The child is taken from his protected environment and is placed in direct competition with others. There are problems due to the sudden separation from his parents, problems caused by the necessary adjustment to the teacher and his classmates, and problems due to mental retardation and academic difficulties. In addition, poor health, frequent changes of school, and irregular attendance, may aggravate the situation.

6. *The recreational factor.*—It has already been mentioned under the neighbourhood, but it should be stressed. The child who attends both public and religious schools and who has to work after school needs some relief from these burdens and should have adequate opportunities for play. The crowded slums, without playgrounds and clubs, without Y.M.C.A.'s or Scouts, produce problems in the children dwelling there.

METHODS OF INVESTIGATION

The case reports given in this article have been taken from the Neurological Clinic and the Clinic for Psychological Medicine at the Hos-

pital for Sick Children, Toronto. The children have been referred from various sources, from parents, from schools, from social agencies, from outside physicians, and from other departments of the hospital. In the clinics there is a definite routine which begins with a complete physical and neurological examination. Following this a full psychiatric history is taken from the parents, which commences with a description of the complaints. It is followed by a detailed enquiry concerning disorders of eating, sleeping, elimination or sex habits, about disorders of the emotional life, antisocial trends and failures in social adaption. The next section deals with the parents, the hereditary background and the home situation. Then come details of the neighbourhood and school, and finally the past history of the child, his physical and mental development are discussed. A psychometric examination is done and the child is seen in a friendly interview. If further information is desired a report is obtained from the school authorities, or a visit to the home is paid by a social worker. Treatment is instituted at the first interview and as factors are elicited in later interviews they are used in the treatment.

SYMPTOMATOLOGY

The symptoms of these psychogenic disorders are varied, as they may appear in any system of the body, and may simulate almost any organic disease. In children certain symptoms occur fairly frequently, however, and from them the following classification may be evolved.

1. Disorders of movement, including tics simulating chorea, convulsions simulating epilepsy, various pareses simulating cerebral tumours, etc.

2. Disorders of visceral sensation, including anorexia and vomiting simulating gastric or appendiceal disease, shortness of breath simulating heart disease, enuresis simulating cystitis, etc.

3. Disorders of somatic sensation, including pains simulating pericarditis, pleurisy, or arthritis; loss of sensation simulating peripheral neuritis, optic neuritis, etc.

4. Disorders of behaviour with disturbances in the intellect and in the emotional control simulating early psychoses, post-encephalitic changes, etc.

1. *Disorders of movement.*—Many children with tics or habit spasms are sent to the clinic with the diagnosis of chorea. In most cases the correct diagnosis may be made upon the physical examination alone, but no improvement can be expected until the underlying factors are discovered and treated.

CASE 1

This child, E.W., a girl of four, was referred because of twitching of the face, crying spells, temper tantrums, refusal to eat, periods of shouting, and attempts to bite her mother. The diagnosis on referral was chronic chorea following an acute onset. There had been no complaints until the onset of facial movements four months previously. Because of the character of the movements and a rheumatic family history this was accurately diagnosed as a mild attack of chorea.

The child, who did not feel ill, refused to remain quietly in bed. To make her do so however she was strapped down by a safety jacket. Almost immediately she became unmanageable, and began to show temper tantrums and outbursts of screaming. Her small, aggressive father began to punish her and her emotional mother took refuge in tears and compromises. Their home was a small cottage which provided no refuge for the harassed parents.

The examination revealed only habit spasms. The condition, which began as a mild chorea, was badly handled by restraint and soon produced the emotional disturbances and habit spasms. The parents and the small house served to aggravate the situation.

Restraint was abolished and the child was placed in a foster home where the problems vanished within a week. The case was freely discussed with the parents until they were able to make a good adjustment when the child returned home. The patient has been followed for six months with no evidence of any recurrence.

CASE 2

J.A., a large boy of twelve, was referred with the diagnosis of chorea. He blinked his eyes, shrugged his shoulders and twitched his face, was depressed about his school work, and had become moody and irritable.

This boy, a poor scholar, had changed schools many times and disliked his most recent school. There he had been placed in Jr. III, was tested, given an intelligence quotient of 89, and transfer to a special school more suited to his capabilities was advised. This was financially impossible, and he was forced to remain at the regular school. His home life was unsatisfactory, his father, a pensioner, could not obtain steady employment, and his step-mother nagged and scolded him because of his poor progress. There was no evidence of chorea, but habit spasms of the face and arms were present. The problem was caused by the scholastic situation, aggravated by bad handling at home.

The boy was admitted to hospital and within a short time the movements had ceased. The situation was explained to his parents and they were advised to ignore any further movements and to give him more freedom at home. Arrangements were made to attend the special school and when last seen the boy had been free from movements for many months.

CASE 3

B.A., a Jewish boy of eleven, was referred for investigation. There were numerous complaints; he rolled his eyes, shrugged his shoulders, and made peculiar noises in his throat. There was continual friction with his sister. He was jealous, disobedient, and threw things around in temper tantrums. His school work was poor and his Jr. III report described him as lazy and careless.

The history revealed an emotional, tearful mother who threw up her hands at any difficulty, and an ineffectual father who knew only bribery as a means of discipline. His sister was older and felt that age meant priority in the family. The boy felt that the male sex should take precedence, and this led to continual

quarrels as they fought for the dominant position in the home. There were other factors; he had no time to play because he was forced to attend both public and Hebrew schools, and he, a very left-handed child, was forced to use his right hand in both schools. He showed no chorea or physical abnormalities; and his mentality was normal.

The mechanism was simple. An intelligent boy, continually quarrelling with his sister, had been carrying a double school burden, aggravated by ineffectual parents and the use of the non-dominant hand at school. Treatment was directed to each of these factors. Hebrew school was stopped and was replaced by a boys' club and a summer camp. He was allowed to use his left hand in school, and soon was able to write extremely well. To alleviate the quarrel between the children his sister also was given more outside interests. This was a successful move and both lost interest in being the dominant member of the family. General instructions were given the parents, but this was practically useless and most of the work had to be done with the children. There has been a definite improvement, no tics, good school progress, and increased happiness and contentment at home.

2. *Disorders of visceral sensation.*—A number of children come to the hospital because of abdominal pain. Amongst this group are some whose origin is psychogenic.

CASE 4

E.N., a large girl of twelve, was referred from the surgical clinic with a long history of vague irregular abdominal pains, usually in the lower right quadrant and occasionally in the right leg. These had been very severe last September, and at that time sub-acute appendicitis was diagnosed and appendicectomy performed. Following this the pains returned at intervals and adhesions were considered as the probable cause.

There was an unhappy school situation, the girl had repeated twice, and had been in three different classes in the last two years. During the last transfer she had missed some groundwork in arithmetic and was unable to keep up with the rest of the class. This upset her and she wanted to go back to her previous school. In addition, she came from a family that complained of chronic ill health, her mother had frequent backaches and her father abdominal pains much like her own. General examination revealed no physical cause for the pains. The psychometric test gave an intelligence quotient of 98, adequate for her class.

The problem was caused by her dislike of the new school and the attendant difficulty in arithmetic. The pattern of the complaint was probably supplied by her father. She was given special instruction in arithmetic, became satisfied with her new class; the abdominal pains disappeared, her arithmetic improved, and she was doing quite well at school when last seen.

CASE 5

M.F., a lad of ten, was brought to the clinic because of abdominal pain and vomiting. Acute appendicitis had been diagnosed in one of the attacks, but because of the rapid subsidence of symptoms operation was not performed. The complaints were loss of appetite, abdominal discomfort, inability to eat breakfast, and frequent attacks of vomiting before school.

The school report was satisfactory; he was apparently doing good work in the II book. The boy himself gave the solution. He had prepared for a term examination but was weak in literature. In order to avoid that subject he deliberately vomited and complained of abdominal pain. He was kept home, a doctor was called, diagnosed appendicitis, and put him to bed for a week. During this time he missed the rest of the examinations for which he was fully prepared. He felt that he could not make up these marks in the next examinations, became panicky, began to dislike school, and vomited in order to stay at home. In addition to the regular school he spent four nights a week at a Hebrew school. The vomiting, deliberate at first, became involuntary and occurred almost every day.

General examination was negative except for a slight visual defect corrected by glasses. A psychometric examination gave a mental age of ten years.

The mechanism was obvious and the treatment simple. Hebrew school was cancelled, the boy was assured that he had not prejudiced his opportunities for passing, that his school report was good, and that with a little work in literature he would probably be successful. The vomiting ceased immediately and there was no difficulty with the next examinations.

3. *Disorders of somatic sensation.*—Many children come to hospital because of headaches. Some have been diagnosed as brain tumours, encephalitis, etc., but many of these turn out to be psychogenic.

CASE 6

A.N., a girl of eight and a half, was referred as a possible brain tumour. She complained of severe headaches, worse at night or in the early morning, and first noticed in the fall after school started. The child, who was the daughter of a school trustee in a rural community, in spite of long absences through ill health, had been rapidly pushed through school. She was now in Jr. III, although she had only spent a few months in Sr. I and the II book. By hard work and long hours of study she was barely able to keep up with the class.

Complete physical examination, urinalysis, and radiographs were negative. A psychometric test gave a mental age of nine.

The headaches were produced by over-loading this child with Jr. III work, which requires a mental ability of approximately ten years. The treatment was simple. One teacher had all classes and was able to reduce her work to a slower pace, combining some Jr. III and II book material. Under this system she became happier, the headaches cleared in a few days, and were absent when seen some months later.

CASE 7

M.H. came to the clinic complaining of severe occipital headaches aggravated by noise, excitement or school. She had lost interest in other children and wanted to stay at home. The girl had always been shy, making few friends, and having few interests outside school and home. All her family had shown marked maternal attachments and it was almost impossible to separate the patient from her mother. Her scholastic record had been excellent until recently, but on several occasions her teacher felt compelled to reprove her for the lack of outside activities. In addition, this tall, pale girl was becoming more conscious of her appearance, which was marred by very protuberant teeth and a receding lower jaw.

The examination revealed no intracranial lesion and no organic cause for her symptoms.

The shyness and withdrawal which had been present for a long time was aggravated by the reproof of her teacher. She began to lose interest at school, her work deteriorated, and she began to retreat to her family and home. The complaints were developed in an attempt to remain at home away from the school which she now disliked. She had no outside interests to turn to, became apathetic, and almost refused to go out of the house. The girl was told that she could do well at school if she returned, that she needed more outside contacts and a wider life. This was provided through the Y.W.C.A., Girl Guides, and a summer camp. In addition

she was referred to an orthodontist for the correction of her dental deformity.

A definite improvement occurred, the headaches vanished, she returned to school and was soon back in the upper section of the class, and she became interested in outside activities, making many new friends. The result has been successful, and as her mother says "She is much better; it's funny, though, because the doctor didn't do anything".

A number of children arrive with symptoms diagnosed as arthritis. Amongst these was the following.

CASE 8

K.S., a girl of fourteen, was referred as a case of traumatic arthritis. Two weeks previously she had bumped her head, and from that time onward had complained of a continuous pain in the neck. She had been a problem at home for some time, as she had to be coaxed at meals with special foods, was jealous of her younger sister, refused to go to bed at the same time, insisted upon leaving the light on in the bedroom, and would often wet her bed. She was irritable, fought with her sister at the slightest excuse, and frequently presented crying spells and temper tantrums. She was often disobedient, and her mother had whipped her, bribed her and coaxed her, but with no success. Outside the home she seemed to show a better adjustment and had made many friends. She disliked school, failing twice, and resenting the presence of her younger brother in the same class.

Her parents were not particularly stable. Her father had deserted the family in 1933 and following this her mother, an emotional, tearful person, suffered a nervous breakdown. At the present time they were forced to live with the maternal grandparents.

No cause for the pain was found on physical examination. A psychometric examination gave a mental age of thirteen and a half which should have placed her in Junior IV instead of Senior II where she was.

The mechanism was that of a poorly handled, headstrong girl who had suffered a slight injury at school. There had always been some resentment at her failures in school and the presence of her younger brother in the same class. These had combined to produce the functional pains, possibly in an unconscious attempt to avoid school. The mother was asked to ignore the pains and to send her back to school. She was given full instructions in the handling of the temper tantrums, feeding problems, discipline, etc. No change was made in the school situation, but the child was given more outside activities and referred to a summer camp. The mother was introduced to an adult social agency for guidance and recreation.

The general improvement in the home was noticeable, and with this improvement the school work improved and the pains vanished. When last seen she had been free of these pains for some months.

A number of cases have been referred with disturbances of vision, varying from blindness to diplopia. From this group three cases have been selected.

CASE 9

G.L., a pleasant stout girl, was referred with the diagnosis of an acute optic atrophy. One week prior to the final examination she had complained of an inability to see objects around her. This had improved, but she was unable to read without having a severe pain over her eyes. In addition there was a history of headaches dating from infancy and associated with vomiting and pains between the eyes. These latter headaches were migrainous, and were present in her father and his family.

The blindness was explained by the following history. The patient was in Sr. III and until this year had always led the class. This fall, however, a boy had arrived from another school and had passed first in the term examinations. The patient felt she would not lead the class this year and began to worry. This aggravated her migrainous diathesis, and she woke up one morning with a migrainous headache and blurred vision which soon cleared up. The patient saw in this complaint an excuse for impending failure and she continued with the symptoms. If she could not see she could not read, and if she could not read she could not study, and if she could not study she could not be expected to lead the class and people could not blame her if she came second.

When examined she complained of a markedly blurred vision and could see no better than 6/24. Her fields were full however, the discs normal, and by suggestion at this interview, vision improved to 6/6. At this time school was over and she had no reason for remaining partially blind. It was easy by suggestion to produce a rapid improvement and there were no further visual complaints. Phenobarbital, ½ grain, t.i.d., was prescribed for the migraine, with a slightly beneficial effect on the frequency of the attacks.

CASE 10

T.V., a large well developed girl of twelve, was sent to the clinic as a case of cerebral hæmorrhage. The history was that she became sleepy a few days after school ended, could not recognize her relatives, and remained in a drowsy condition for several days. This improved but when she was up she complained of dizziness and double vision which persisted until the visit to the clinic.

She had attended the out-patient department for years because of convulsions, both grand and petit mal, was in Jr. III at school, had never liked school, and had failed this year. Several intelligence tests had been done with ratings of 73 and 74, a borderline mental defective.

General examination revealed no cause for the dizziness and no evidence of any cerebral lesion.

The diagnosis lay between a functional disorder and an acute encephalitis. The answer was supplied by the patient who said that she had put the whole thing on to avoid any punishment for her failure in the final examinations. Following this information the symptoms cleared up. She has attended the hospital for her convulsions, and during the last year has had no further visual defects.

CASE 11

H.D., a large boy of fourteen, was referred from a small city as having an occipital lobe tumour. The complaints were periodic bouts of headache associated with vomiting and blurred vision, irregular school attendance and dislike of school. He had no friends, was solitary in his habits, and was cruel to younger children. At home he continually quarrelled and fought with his mother and other members of the family. He had been accused of sexual activities with other children but this was never definitely proved.

Investigation showed that he was in Junior IV, unable to keep up with the class, particularly in reading. Ever since the first grade there was a difficulty in reading, and although he could never pass in that subject he was regularly put into a higher grade each year.

A physical examination was normal; there were no visual defects. A psychometric examination in 1934 gave a reading of 90; in 1937, 80, with a due allowance for his reading difficulty. The boy was given special tests, and it was seen that his reading ability was only that of a Jr. I scholar, a child of six. When he came to the tests for the higher grades he was unable to do them, began to complain of headaches and blurred vision, guessed at new words, and was unable to sound out a phonetic approach. Complete grade tests were done,

reading and spelling were Jr. I, arithmetic, geography and history were Jr. II. In no subject was he up to his class of Jr. IV.

This child had a specific reading disability which was sufficient to cause the poor school progress and the marked dislike of school. This poor adjustment at school had a great deal to do with his solitary nature and the frequent quarrels at home. In this case special teaching in reading, phonetic in type, begining at the Jr. I level and carrying him along to his grade, was advised. The rest of his school work would improve along with the improvement in reading. As yet we have had no report upon his progress, but several similar cases have come from Jr. I to Sr. III reading in six months of phonetic teaching.

4. *Disorders of behaviour.*—A certain group are referred because of changes in personality, where the diagnosis lies between the end-results of encephalitis and behaviour problems of purely psychogenic origin. The following case illustrates this point.

CASE 12

J.S., a quiet boy of seven, was referred as suffering from a possible post-encephalitic syndrome. There were numerous complaints. He was restless, disobedient, and would answer back; he would not go to bed on time and would wet his bed every night; he was awkward and would drop things at the table; he insisted on being the centre of attraction; he had become very excitable and irritable; he was jealous of the other children, and would fly into temper tantrums if he did not get his own way.

Two years previously he had a series of convulsions which lasted for hours and were followed by a long period of drowsiness. The family physician told the family that the convulsions would recur if the boy were checked and that he was not able to stand the strain at school. Consequently all discipline was relaxed, the child took full advantage of the situation, and a series of problems resulted.

No signs suggesting encephalitis could be found. A psychometric test gave an intelligence quotient of 91 —normal intelligence.

The family were told that he would not have convulsions if crossed, that he should be placed on the regular family routine, allowed no extra privileges, and should be sent back to school. Fortunately, the parents were stable people who followed out instructions, and the boy was non-aggressive, giving in readily to discipline. Within three weeks the symptoms vanished and the child returned to his old standing in the group.

DISCUSSION

In such a small series it is not advisable to consider statistical reviews. Several etiological factors seemed to predominate however. In over three-quarters of the children there were definite difficulties in school adjustment. Interestingly enough, there were only about three of these children whose problems were secondary to intellectual inadequacy; the others were normal in intelligence yet were unable to make a satisfactory adjustment. In the latter group the fault did not lie with the child but rather with the school or economic system; in one case a child of normal intelligence was placed in a grade over her ability; in another, a specific reading difficulty was caused by faulty methods of teaching; in another, owing to financial difficulties, the child was moved from school to school and had no chance to become stabilized; and in another the child was made to carry the double burden of religious and public schools, and was also forced to write with his right hand when he was definitely left-handed in all other activities.

Another common factor in our series appeared to be parental inability to handle the problem once it had arisen. Many of the parents were unstable people, unable to handle their own problems satisfactorily and with no emotional control over themselves. When the problems arose in their children they became greatly upset, lost their judgment, and either neglected the child or pushed and continually corrected him. From none of these parents could the child obtain support—they were unable to share his burden and only aggravated the situation.

Two other factors were met fairly frequently, namely, inadequate recreational facilities and mismanagement of illness. The problems secondary to inadequate recreation can be easily visualized, but few realize how many problems are caused by the poor handling of disease. A happy, contented child may be changed into a bitter, complaining despot through the power and constant attention given by his worried parents. In some cases his whole future may be changed, and it may be months before he makes a satisfactory adjustment to life.

We cannot always explain why one child should develop a tic because of scholastic problems, and another, blindness, in an almost similar situation. In some cases the history explains the selection of the pattern, in others it gives no help. Many times the pattern is provided by the people about the child, as shown by the case of abdominal pain where the father had recurrent bouts of colic for years, or by experiences in the past life of the child, as shown by the girl whose habit spasms were probably based upon an antecedent attack of chorea. In some cases we are unable to explain the symptoms, and in a very small number of cases the child apparently chooses the symptoms himself. As a general rule, however, very few children deliberately chose these complaints to avoid an unpleasant situation; in most cases the symptoms are an involuntary production of the strain associated with this undesirable situation.

TREATMENT

Treatment may require the cooperation of few or many people. The physician alone may be sufficient, or the help of outside agencies may be required. Their spheres overlap and may be outlined as follows. (1) The physician who attempts to gain the confidence of parent and child, and deals directly with their problems through interviews. (2) The social worker, either from a hospital or social agency, who goes to the home. There she helps carry out the instructions of the physician and deals in a practical manner with the problems that arise in the home. (3) The recreational facilities, the Scouts, Y.M.C.A., etc., which attempt to give the child recreational and group activities, and at the same time help him to adjust to others. (4) The social agencies, which are interested in the family and help the parents with their own problems. (5) The educational authorities, who arrange the proper school placement with auxiliary class, special schools, etc.

These various therapeutic measures can be illustrated by the following case. C.D., a small girl, came to the clinic complaining of severe headaches. She lived in the slums with her parents, an unhappy, constantly quarrelling couple. At school she was in difficulty, having repeated several times. The treatment of the case involved (*a*) the physician who explained to the parents that the headaches were due to school difficulties and gave instructions about handling them; (*b*) the social worker who visited the home and was able to help the mother make a better adjustment to the conditions of the home; (*c*) the girls' club which gave the child a sense of achievement in games and hobbies and brought pleasure into her life; (*d*) the adult agency which became interested in the parents and endeavoured to help them settle their difficulties through social activities, conferences, etc.; (*e*) the educational department which places this child in an auxiliary class where she could carry on with less difficulty. In this one case, five different groups worked together to cure the headaches and the factors behind them.

SUMMARY

1. Twelve cases caused by psychogenic factors and showing symptoms suggestive of organic disease have been presented.

2. A brief review of the etiological factors producing such conditions has been given.

3. The methods of investigation of such cases at the Hospital for Sick Children, Toronto, have been summarized.

4. A brief discussion of the modes of treatment in these children has been presented.

THE MORTALITY OF APPENDICITIS

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AN analysis of any series of cases of appendicitis will show that the mortality rate is low where acute cases are treated before complications set in and that where treatment is delayed the death rate rises rapidly; that most of the fatal cases are found where the disease has been allowed to progress to the point of rupture and is complicated either by a localized abscess or general peritonitis. An analysis of a series of 1,550 cases treated in the adult wards of the University of Alberta Hospital substantiates this statement. Appendicitis still rates tenth as a cause of death in this country. A great many of these deaths are absolutely preventable, although little more can be done at present by the surgeon to lessen the mortality. The mortality rate varies so widely in different provinces that it should prompt a critical study of the subject from every angle.

The mortality of any disease can be reduced by reducing its incidence, and by improving methods of diagnosis and treatment. If we analyze these three factors it will be apparent that there is not much hope of influencing any-one of them, and for that reason we have come to the conclusion that any future improvement in our statistics will depend on educating the public to appreciate the necessity of reporting sick to their family physician early, and the family physician not to loiter too long before referring the patient to the surgeon.

TABLE I.

CRUDE DEATH RATES PER 100,000 POPULATION, FROM APPENDICITIS, BY PROVINCES, 1921-1936

Year	*P.E.I.*	*N.S.*	*N.B.*	*Que.*	*Ont.*	*Man.*	*Sask.*	*Alta.*	*B.C.*
1921	12.4	10 7	12.4	..	11.7	11.8	16.2	18.2	10.7
1922	4.5	10.9	10.0	..	11.1	14.4	16.4	21.3	12.6
1923	10.3	11.6	11.6	..	11.8	12.0	15.8	20.6	9.9
1924	5.8	7.2	13.8	..	13.5	14.2	16.1	22.9	10.9
1925	14.0	10.7	15.5	..	13.2	14.7	17.7	18.4	9.2
1926	9.2	10.7	14.6	15.2	12.4	12.7	17.1	23.0	8.6
1927	11.5	10.3	16.1	15.8	12.7	13.8	14.4	24.0	10.1
1928	11.4	12.2	16.2	15.0	13.2	12.0	16.6	19.1	12.3
1929	13.6	9.7	14.9	15.7	13.1	10.2	19.3	22.2	10.0
1930	12.5	12.3	11.1	15.2	13.9	13.5	17.6	19.4	11.8
1931	6.8	9.7	12.7	15.5	12.9	10.9	14.2	18.0	8.6
1932	15.7	12.7	15.0	16.7	11.4	9.6	15.5	18.5	11.5
1933	10.1	9.0	14.8	15.8	11.6	12.1	17.9	17.4	10.0
1934	13.5	11.8	16.5	17.0	12.5	10.0	17.1	18.3	13.4
1935	21.3	12.9	15.6	15.8	10.6	9.8	17.4	20.8	9.7
1936	12.0	12.1	11.3	14.5	10.4	11.3	17.3	20.1	10.0

NOTE: Quebec did not enter the national system until 1926.

(From the Dominion Bureau of Statistics.)

THE INCIDENCE OF APPENDICITIS

Until more is known about the specific cause of appendicitis nothing can be done to lessen its incidence. One often hears that the affection is on the increase but it is difficult to prove or disprove this statement. It is an accepted practice in recording statistics to give appendicitis priority over the other abdominal conditions in assigning the cause of death, if two conditions are found concurrently and appendicitis is one of them. For that reason, statistics may be misleading, but many authorities might be quoted as of the opinion that the disease is much more common that a generation ago. Certain anatomical peculiarities may be predisposing factors in its etiology. The appendix has a very poor blood supply and is well supplied with lymphoid tissue, ever fragile and easily infected. Abnormal peritoneal bands, *e.g.*, Lane's kink, the peritoneo-colic fold of Jenesco, the bloodless fold of Treves, or a Jackson's membrane, may favour the onset of appendicitis. It is impossible to eliminate any of these contributing factors.

Many theories have been advanced as to how the appendix becomes infected. It is probable that it can be infected from the blood stream, as cases are frequently seen during epidemic sore throat and acute tonsillitis. Aschoff believes that the appendix has a specific bacterial flora of its own and he has isolated a certain micrococcus which he claims is the specific organism causing appendicitis. Undoubtedly other organisms such as *B. coli,* streptococcus, *B. welchii* play a part in the etiology of appendicitis, as these organisms are constantly found on bacteriological examination of the pus obtained in suppurative cases. Blocking or shutting off of the arterial supply of the appendix immediately causes death of the organ and gangrenous appendicitis. Stagnation and obstruction also play a part. Stagnation favours the rapid multiplication of the bacteria contained in the lumen of the organ, and as the lining of the appendix is mucous membrane the inflammatory changes which result from infection may vary from a simple cryptitis or a catarrhal inflammation of the mucous membrane to suppuration of all coats. It is claimed that it is necessary to have a damaged mucous membrane before acute inflammation will follow obstruction. No doubt a damaged mucous membrane will favour the onset of inflammation. Crypts in the mucous membrane may retain infective material, and inflammation may commence in the crypts and spread to the submucous, muscular, and subserous coats by way of the lymphatics, or, similarly, infection may attack the damaged mucous membrane. If the inflammatory process subsides when it has not extended beyond a catarrhal inflammation of the mucous membrane or a simple cryptitis the end-result of the appendicitis may be a damaged or scarred mucous membrane, with one or more constrictions of the lumen, which interfere with the appendix emptying its contents, or if the infection invades the submucous or muscular and subserous coats by way of the lymphatics the œdema which follows may result in the lumen being closed and the blood supply shut off, and death of the whole organ through mass suppuration.

These observations on the etiology of the disease give us no clue as to how the incidence of the disease can be lessened, but they help us to understand the progress of inflammation in the appendix, the rapidity with which the disease is capable of progressing to a dangerous stage, and the necessity for early surgical interference.

THE DIAGNOSIS OF APPENDICITIS

Many acute cases are so easily diagnosed that the physician may become a little careless when obscure cases present themselves. Aschoff puts the frequency of error in the clinical diagnosis at his clinic as 18 per cent for acute cases, 23 for subacute cases, and 34.7 for chronic cases. It is gratifying to note that the acute cases (which are the most dangerous) are the easiest

to diagnose. It would appear that, instead of being a disease of easy diagnosis, appendicitis may present many difficulties and pitfalls. The diagnosis is simplest when the symptoms present are: sudden onset of pain, nausea and vomiting, rapid pulse, leucocytosis of 12,000 to 20,000, with tenderness in the right lower quadrant and splinting of the right rectus muscle. One should not be lulled into a state of inactivity by reason of a low leucocyte count, as surgeons of wide experience can recall many cases where the appendix when removed showed advanced inflammation accompanied by a low white-cell count. When the appendix occupies an unusual position and is complicated by anatomical abnormalities the symptoms may be unusual and the diagnosis more difficult. Mistakes will be fewer when physical examinations are more complete. The obturator test, the psoas test, and a rectal examination are all useful, and may often elicit tenderness that is obscure in atypical cases. Accurate diagnosis will depend on thorough and complete examination rather than on elaborate laboratory tests. A consultation by young practitioners with older and experienced surgeons is often very helpful.

THE TREATMENT OF APPENDICITIS

In order to evaluate treatment and ascertain if the mortality can be reduced we have divided the cases in this series into four groups and have reviewed each group separately.

Group I includes acute cases where the appendix had not ruptured and the disease was still limited to the appendix, whether catarrhal, suppurative or gangrenous. Cases with some degree of local peritonitis but without pus are included in this group. *Group II* includes acute cases with ruptured appendix and complicated by a localized abscess. *Group III* includes acute cases with ruptured appendix and complicated by general peritonitis. *Group IV* includes all cases diagnosed as subacute, recurring, relapsing, remitting, intermittent, obliterative, sclerotic and chronic.

Table II shows in a brief manner that it is in Groups II and III that death is likely to occur. If all the cases in Groups II and III could have been received at hospital early enough to have been treated as Group I, and so classified, the mortality would have been correspondingly lower. Only by early diagnosis and early treatment can this be done, and delay in treatment will increase the number of cases treated in Groups II and III, and result in an increase in the death rate. In the first three groups, which include all acute cases, complicated and uncomplicated, the mortality rate for the 773 cases is 3.36 per cent, whereas the mortality rate for the uncomplicated cases in Group I is only 0.6 per cent.

TABLE II.

Diagnosis at operation	*Number of cases*	*Mortality*	
		Cases	*Rate*
GROUP I.			Per cent
Acute catarrhal appendicitis Acute suppurative appendicitis. Acute gangrenous appendicitis. (Cases with local peritonitis but no pus are included in this group.)	668	4	0.6
GROUP II.			
Acute appendicitis complicated by localized abscess.	61	7	11.47
GROUP III.			
Acute appendicitis complicated by general peritonitis	45	15	33.3
GROUP IV.			
Intermittent appendicitis Remitting appendicitis Relapsing appendicitis Recurrent appendicitis Sclerotic appendicitis Obliterative appendicitis Chronic appendicitis	776	3	0.38

The treatment of appendicitis is purely surgical. Any attempt to place it in any other category is fraught with grave danger to the patient. When the inflamed appendix is removed while inflammation is limited to the organ our patient is soon restored to normal health, even in cases of suppurative or gangrenous appendicitis with severe constitutional symptoms. Although our treatment will be influenced by the advancement made by the disease at the time first seen by the surgeon, the best results are obtained when the patient is seen early and operation is done early.

In the first group of cases, which includes all acute cases, whether catarrhal, suppurative, or gangrenous, when the disease was limited to the appendix or where only localized peritonitis without pus was present, their results may be considered satisfactory. The mortality rate is low, convalescence rapid, and the patient is able to resume his usual vocation without much loss of time. The progress of inflammation cannot

TABLE III.

APPENDICITIS AND LOCALIZED ABSCESS

Hospital number	*Number of days ill before calling doctor*	*Number of days ill before entering hospital*	*Number of days in hospital before operation*	*Appendix removed and abdomen drained*	*Abscess drained but appendix not removed*	*Number of days in hospital*	*Results*
26905	8	8	2		X	29	
26282	4	4	1		X	33	Returned for appendectomy 3 months later and was 23 days in hospital on 2nd admission.
27728	3	3	1	X		37	Pyelitis complicated convalescence.
27820	11	19	9		X	27	
24794	NR	NR	1	X		44	
29362	4	4	1		X	10	On a previous admission this patient refused operation for an uncomplicated attack of appendicitis. He recovered without operation but returned this time with localized abscess.
30125	7	14	14	X		24	
28990	7	7	2	X		41	
26742	1½	1½	1	X		18	
26354	Abscess opened and drained in country. Admitted to U.A.H. with 2 fæcal fistulæ.					38	Died; general peritonitis.
13245	14	14	1		X	21	
21097	2	30	1		X	31	
22029	5	5	1	X		14	
24553	8	8	2		X	15	Died; general peritonitis.
22601	1	7	1		X	23	
22161	14	14	1		X	12	
25668	4	4	2	X		24	
20937	4	4	2		X	52	T. & A. done on 44th post-operative day.
21809	NR	NR	1		X	27	Returned in 3 months for appendectomy.
20302	10	10	3	X		18	
18588	2	2	1	X		3	Died; general peritonitis.
18231	2	2	1		X	29	
13330	7	7	2		X	19	
13113	NR	NR	1	X		28	Phlebitis in right leg complicating convalescence.
16734	NR	NR	1		X	29	On D.I. list 4th to 6th post-operative days.
15998	4	4	2		X	37	
15618	6	6	3		X	36	Returned in 3 months with recurrent appendicitis.
14716	10	10	1		X	22	
14079	7	7	1		X	37	
16524	NR	4	0	X		7	Died.
16799	1	1	0		X	41	
10299	NR	NR	0	X		8	
11835	3	3	0	X		35	Nausea and vomiting 20th post-operative day.
767	3	3	1	X		38	Secondary suture done on 25th day.
30327	1½	40 hrs.	0	X		27	Bronchopneumonia 3rd post-operative day.
24752	5	5	2	X		42	Secondary suture necessary.
28534	4	4	0	X		40	
21033	3	3	0	App.	No drain	34	Drain inserted on 8th post-operative day.
18524	6	NR	0	X		28	
18573	1	1	0		X	25	Appendiceal abscess drained. Returned nine months later with ruptured appendix and localized abscess. At second operation patient's appendix was removed and abdomen drained.
26665	1	1	0	X		24	
22815	5	5	0	X		24	
21261	1½	1½	0	X		11	Two months pregnant.
20527	2	2	0	X		24	Toxic psychosis 2nd to 20th days.
22248	1	1	0	X		20	Transposition of viscera.
23319	2	2	0	X		40	
24359	2	2	0	X		23	
16497	2	2	0	X		25	
13951	5	5	2	X		22	
26099	2	2	0			14	Sutures removed on 9th day. Incision ruptured. Died; general peritonitis.
27705	1½	1½	0	X No drain		9	
27676	9 hrs.	9 hrs.	0	X No drain		11	
18931	3	3	3		X	29	
19040	2	2	0	X		21	
20890	3	3	1	X		20	

TABLE III.—*Continued*

APPENDICITIS AND LOCALIZED ABSCESS

Hospital number	*Number of days ill before calling doctor*	*Number of days ill before entering hospital*	*Number of days in hospital before operation*	*Appendix removed and abdomen drained*	*Abscess drained but appendix not removed*	*Number of days in hospital*	*Results*
12360	4	4	1	X		116	Peri-rectal abscess—drained 26 days post-operatively. Rest of appendix removed 1 year later.
11120	NR	10	1		X	23	
15158	NR	1 year	3	X		106	Died of general peritonitis. Fæcal fistula persisted after appendectomy.
23168	14	14	2	X		54	Fæcal fistula. Secondary suture 27th post-operative day.
27393	3	3	1		X	5	Died; acute gangrenous appendicitis with perforation and generalized peritonitis.
29931	4	4	63	X		93	

NOTE.—In the seven deaths in cases with localized abscess, three were in cases where drainage only was done, and four in cases where the appendix was removed.

be estimated in days, and if the disease is still limited to the appendix operation is indicated as soon as the diagnosis is certain. This rule will result in the maximum number being operated on as Type I cases, and the minimum treated as Type II and III.

The treatment of acute cases complicated by a localized abscess was accompanied by a mortality rate of 11.47 per cent, which is in marked contrast to those operated on early. Many factors enter into the treatment of this type of case and each case will require careful analysis. Where it is clear that infection is spreading and general peritonitis is imminent operation should not be delayed. On the other hand, when the abscess is well walled off and the patient's general condition indicates recovery operation may be withheld. When operation is performed, what is to be done can only be decided at the time of operation. Incision for drainage may be wisest, but if the appendix is readily found it should be removed. Three patients who had drainage died, and there were four deaths among those who had the appendix removed at the first operation. It has been our experience that where a drainage operation was performed and the patients were told to report back later for removal of the appendix only a few obeyed. Four did and 13 did not (see Table II). We have not been able to trace the 13 to see how many ran into trouble again because of the appendix not being removed. Our cases complicated by general peritonitis have been accompanied by a mortality rate of 33.3 per cent, and account for almost half the deaths in the whole series. Prevention of general peritonitis can only be accomplished by early operation. No matter what means are adopted to combat the peritonitis, once it has set in a high mortality rate is likely to follow, and even if the patient gets well a lengthy convalescence, added to a long stay in hospital, will likely result. Our best results were obtained in those cases operated on early. When cases arrive at hospital after peritonitis has been present for several days it may be necessary to postpone operation and resort to conservative treatment. Any case with general peritonitis is desperately ill, and will require the utmost care that any surgeon can give him. The standard treatment of rest, secured by morphine administered at regular intervals, and siphonage of the stomach by a suitable negative-pressure suction apparatus, and intravenous feeding is our sheet anchor. The time for operation must be decided in each individual case. Many are obviously too ill to withstand the added shock of an operation, and delay will be the wisest course. How much delay must be decided by the progress of the case.

In the fourth group of cases we come into the realm of elective surgery, and it is for that reason that these cases have been grouped together. It matters little whether the individual case is operated on tomorrow or next week. The mortality rate should be extremely low, and, except for the few uncontrollable deaths, due to pulmonary embolism and cardiac failure and the like, the mortality is likely to be nil. These cases

are a contrast to those in the first group where delay may result in our case slipping into Groups II and III, where the mortality rate will be many times what it should be for Group I. Many of the cases in Group IV will develop acute attacks if left alone, and therefore it is wisest to remove the appendix in these cases.

Reference to Tables III and IV shows that little fault can be found with the promptness with which physicians refer their cases to this hospital. Almost all were referred as soon as seen. In those that arrived late, delay in most instances was due to the patient not calling the doctor until he had tried home remedies or procrasti-

TABLE IV.

APPENDICITIS AND GENERAL PERITONITIS

Hospital number	*Number of days ill before calling doctor*	*Number of days ill before entering hospital*	*Number of days in hospital before operation*	*Appendix removed and abdomen drained*	*Abdomen drained but appendix not removed*	*Number of days in hospital*	*Results*
16725	7	7	1		X	2	Died; acute general peritonitis; acute suppurative appendicitis.
16364	1	1	0	X		26	
15258	2	2	0	X		37	
15037	8	8	2	X		36	Pyelitis.
14774	4	4	2	X		7	Died; acute general peritonitis; acute suppurative peritonitis.
5616	4	4	1	X		31	
646	1	1	0	X		4	Died; acute purulent peritonitis.
12157	3	3	0	X		49	Secondary suture 30th post-operative day.
11846	1	1	0	X		3	Died; acute general peritonitis.
11866	14	14	2	X		15	
11711	5	5	10		Drained by post. colpotomy	16	Died; acute suppurative peritonitis with perforation of appendix.
10757	NR	NR	0	X		25	
10408	6	6	2	X		41	
10614	1	1	0	X		18	
16967	3	3	0	X		47	
20582	1	1	0	X		14	
30130	18 hrs.	18 hrs.	0	X		28	Secondary suture, 15th day.
28966	4	4	1	X		29	Secondary suture, 17th day.
29357	1	3	0	X		4	Died.
29865	14	14	3	X		2	Died; acute gangrene with general peritonitis.
30952	1	1	0	X		7	Died; acute suppuration with general peritonitis.
28216	7	7	0		X	6	Died.
27942	21	21	1	X		25	
27192	2	2	0	X		54	Bronchopneumonia.
26584	10	10	1	X		17	
26244	9	1	No operation				Died 23 hours after admission.
9940	1½	1½	0	X		26	
22952	2	2	0	X		22	
18733	1	1	0	X		31	
17528	1	1	0	X		18	
20011	1	2 months	0	X		31	
19190	1	1	0	X		32	
19779	NR	NR	0		X	5	Died; ruptured gangrenous appendix with acute general peritonitis.
19392	1	1	0	X		27	
25806	4	4	1	X		25	
24553	8	8	2		X	15	Died; gangrenous appendix and acute general peritonitis.
24316	1	1	0	X		63	Bronchopneumonia, 7th day.
24794	NR	NR	0	X		45	Chronic rheumatic carditis.
24548	4	4	6	X		34	
22680	2	2	1	X		9	Died; acute gangrenous appendix with general peritonitis.
21398	NR	NR	NR	X		62	Died; general peritonitis, 3rd post-operative day; hemorrhage.
9148	30	30	35	X		37	Died; acute suppurative appendicitis with general peritonitis causing diaphragmatic empyema evacuating through bronchi.
15037	2	2	0	X		36	
16044	1	1	0	X		18	
11511	1	1	0	X		18	

nated, to see if the condition would not clear up with rest and starvation. This history is more common in patients who have recovered from a previous mild attack without operation and, hoping to be again lucky, take one more chance.

Only a campaign of education can result in a change in this attitude. Even when all cases are seen early there will be the odd case where the appendix has ruptured and the surgeon will have to battle for the life of an extremely ill patient. Among the 1,550 cases used as a basis for this paper were 100 cases among nurses, interns and university students. These cases may be considered to be as ideally treated as possible today. They were all seen early by both physician and surgeon, and in the few where operation was delayed the patient was in hospital under the constant observation of both physician and surgeon, and operation could have been proceeded with at short notice. Because of approaching examinations a few were treated through their attacks without operation, or operation was delayed until holiday time. Even in this series of select cases, where every one was brought under treatment as early as humanly possible, three were complicated by general peritonitis, and in three other cases there was localized peritonitis without pus or abscess formation. Two had free serous fluid in the abdomen. Only the cases of general peritonitis were drained. The appendix was removed in all cases, and there were no deaths. The appendix was found acutely inflamed in 85 instances, and in 14 others, although the symptoms were those of acute appendicitis, the pathologist reported chronic inflammation. In one the condition was found to be an intra-abdominal hæmorrhage due to a ruptured Graafian follicle, and a normal appendix was removed. Even in cases where general peritonitis had occurred the results were satisfactory when operation was done early.

If the general public could be brought to realize the seriousness of delay, and the rapidity with which the disease is capable of progressing, more patients would be operated on early, which is the only solution to the problem of reducing the mortality in appendicitis.

The economic factor should make a strong appeal to the public. The average stay in hospital for uncomplicated cases is eleven days, for those complicated by a localized abscess, 25 days, and for those complicated by general peritonitis 31 days. The complicated cases are likely to leave some degree of permanent or lasting disability. Several required secondary suture; others required a second operation for post-operative incisional hernia. Pneumonia was a post-operative complication twice, and thrombosis of the iliac vein once. Not only will these patients be longer in hospital but a long period of convalescence at home before returning to work will be necessary. The total time lost, computed in dollars, is likely to amount to a goodly sum and should be a strong argument with the laity in favour of early operation.

Insurance statistics, which are usually very accurately kept and therefore very valuable, show the value of an educational campaign.

The authors are indebted to the Metropolitan Life Insurance Company for the figures used in Table V, showing the death rate from appendicitis from the year 1911 to the year 1935. It is well known that the Metropolitan Life Insurance Company has for years carried on an intensive campaign amongst its policy-holders to seek medical advice early when attacked by illness. It is not surprising to find that their statistics show a correspondingly lower mortality than the average for the general public, as shown by the statistics of the United States

TABLE V.

DEATHS PER 100,000 OF POPULATION DUE TO APPENDICITIS

Time	*Metropolitan Life Insurance Company*	*United States Bureau of Statistics*
1911....	10.8	11.2
1912....	11.3	11.0
1913....	11.8	11.8
1914....	11.0	12.0
1915....	11.7	12.1
1916....	12.3	12.7
1917....	11.6	12.5
1918....	10.8	12.1
1919....	11.1	11.8
1920....	12.8	13.4
1921....	14.0	14.4
1922....	13.8	14.3
1923....	*14.5*	14.5
1924....	14.4	14.8
1925....	14.0	14.9
1926....	13.6	14.9
1927....	14.4	15.0
1928....	13.7	15.2
1929....	14.4	*15.4*
1930....	14.3	15.3
1931....	14.3	15.2
1932....	13.5	14.2
1933....	13.4	14.1
1934....	13.2	14.3
1935....	11.5	12.7

(Taken from Twenty-Five Years of Health Progress, published by the Metropolitan Life Insurance Company.)

Bureau. It is to be noted that the highest death rate for the Metropolitan Life Policy Holders was 14.5, and that this peak was reached in 1923. Since then the rate has gradually improved, whereas the death rate for the general public continued to rise until 1929, when the mortality rate was 15.4. Since 1929 the rate for the general public has declined and in 1935 was down to 12.7, which is the same rate for 1916. The rate for the policy-holders which had the benefit of the intensive health campaign has been persistently lower than that for the general public. An active public health campaign, to stress the importance of early operation, should do much to improve the statistics for the general public.

THE ROLE OF DIETETICS IN DERMATOLOGY, INCLUDING A DISCUSSION OF THE CUTANEOUS MANIFESTATIONS OF FOOD ALLERGY*

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IN a discussion of the influence of diet on cutaneous disease it is imperative first to emphasize the relation of the skin to internal organs. Those unfamiliar with the function of the skin might be inclined to consider this structure as a mere inert envelope whose only purpose is to provide a covering for the deeper tissues, possibly because the superficial portion is within our vision. This conception is far from the truth, because it is evident that no organ of the body can live an independent existence. Realization of this fact is an exceedingly important biological principle: the broader our knowledge becomes of scientific medicine, the more one is convinced of the close inter-dependence of all structures which comprise the human or animal body.

Disease changes in any one part can, therefore, be reflected in distant, and apparently unrelated, structures. The skin, as a component part of the body, is no exception to this important rule. It is well known that many serious diseases of such internal organs as the lungs, the cardiovascular system, and the blood-forming organs, frequently manifest themselves on the skin. Further, it is not uncommon for the skin to show the first recognizable signs of these changes. Thus dermatology becomes an important subject in diagnosis, and has an intimate relationship with internal medicine. It follows that the influence of nutrition on the skin is an important factor, and that in order properly to perform its function a sufficient supply of all the components of an adequate diet is necessary.

To define precisely the rôle of diet in dermatology is difficult. Here the use of diet differs in many respects from its usual application in some other branches of medicine. Generally, dermatology has but limited use for the more commonly employed dietary regimens, such as, high- or low-residue diets, modification of the protein diets, high calcium diets, and others of like nature. In dermatological disease one is safe in stating that practical dietetics is employed in a more specific manner, with less inclination towards generalization. Our present knowledge indicates that it is uncommon for the average diet to be the underlying cause of pathological changes in the skin. Disregarding exceptions for the moment, this statement is made despite the commonly accepted opinion that many of the more prevalent skin conditions are caused either by some article of food or by an improperly balanced diet. Invariably, the dermatologist is asked, "Is my trouble caused by something I have been eating?" The usual answer to this query is in the negative. Because of failure to recognize this fact, patients, to the detriment of their health, frequently are prescribed inadequate and poorly balanced diets. Certainly every practising dermatologist has seen the health of growing boys and girls impaired by such dietary restrictions because of the presence of juvenile acne vulgaris. Our first obligation to these patients is to prescribe the necessary food requirements. "Too much acid in the blood" is frequently ascribed as the cause of a variety of skin disturbances. This, again, is an erroneous concept. As far as I am aware, no such entity is recognized in dermatology.

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Eczema is a further example of a common skin disease believed to be caused by dietetic irregularities or certain foods. Apart from the childhood variety and its analogue in young adults (atopic dermatitis), which will be discussed later, the general opinion amongst students of this branch of medicine is that eczema caused by food is a rarity.

The above discussion should not be taken as a denial of the effect of diet in dermatology. Instead, dermatologists attempt to employ diet in a manner more or less specific, and tend strongly to adhere to what has been proved and what has not been proved.

DISEASES OF THE SKIN IN WHICH DIET IS A FACTOR

Obviously it is impossible to cover this entire subject, including the cutaneous manifestations of food allergy, in one lecture. Therefore my remarks will be limited to a few diseases or disease groups in which the factor of diet specifically is concerned.

There are numerous dermatological diseases of serious nature, and while nutritional errors are not causative diet has an important place in their management. A few such diseases are: pemphigus, dermatitis exfoliative, leukæmias, Hodgkin's disease, acute disseminated lupus erythematosus, and new growths. The proper nutritional care of these patients requires the same consideration as it does in pneumonia or typhoid, and must be regulated according to indications and to the patient's ability to utilize food factors. Except for the mention of a small number of diseases comprising this group, no detailed discussion of their dietetic management will be attempted.

1. Vitamin deficiencies.—The known external manifestations of vitamin A deficiency in man are the well known ocular disorder (xerophthalmia), and a spinous or wart-like eruption appearing at the follicles. This process is an interference with the formation of normal keratinized epithelium (keratomalacia). The first change observed is a generalized dryness of the skin, followed by the appearance of spine-like lesions at the follicular openings, to which the descriptive term "toad-skin" has been given. Although skin changes from vitamin A deficiency are uncommon they have been reported recently in the English and the American literature. Frazier and Hu[1] have observed this condition amongst Chinese soldiers; Loewenthal,[2] in the prison population of Uganda; and Nicholls reports the widespread incidence of this process in Ceylon. These lesions heal promptly when Vitamin A is supplied in the form of cod liver oil.

Among a group of babies MacKay[3] has observed a greater susceptibility to diaper dermatitis and intertrigo when the babies were fed diets deficient in A. So far as is known today, no skin lesions result from an excess of this vitamin.

Vitamin B is of particular interest because of the cutaneous lesions resulting from deficiency of one particular fraction of it. The exact number of vitamins in the so-called B complex is still undetermined; but the fraction which is here our chief concern is the pellagra-preventive, or black-tongue (in dogs) preventive vitamin. Lack of B_1, which causes beri-beri, does not lead to any known skin changes.

Pellagra is not uncommon in countries where portions of the population rely for their staple foods on meat (frequently salt pork), maize or corn, and molasses. This is true particularly in the Southern States where, in 1927, over 120,000 cases of pellagra were reported. From 1911 to 1916 the Metropolitan Life Insurance Company recorded more deaths from pellagra than from tuberculosis. Practically all could have been prevented. Apart from the usual diet-deficiency, pellagra also occurs in alcoholics who develop a distaste for food, and is sometimes referred to as alcoholic pellagra. The clinical manifestations follow an identical course in both instances.

The skin changes in pellagra constitute a characteristic and striking feature. They appear principally on the exposed surfaces, that is, the backs of the hands, wrists, face, and neck, and less commonly on the feet and body. These lesions consist of inflammation of varying degree, sometimes forming large blisters, and arranged symmetrically on both sides of the body. Once seen they are not easily forgotten. Since sunlight long has been recognized as an excitant in the production of skin lesions, pellagrins should be protected from exposure to sun as well as from other skin irritants.

In addition to a well balanced diet of from 3,000 to 4,000 calories per day, successful treatment depends on the use of adequate amounts of the vitamin concerned. The essentials are: one quart of milk daily, lean meats and liver,

and 30 to 200 g. of powdered yeast, depending on the severity of the attack. Pellagra is a preventable disease. Permanent control can be obtained by including in the diet the necessary food factors, contained principally in yeast, in fresh meats, and in vegetables.

The association of vitamin C with *scurvy* has long been established. Further interest has been added through the synthesis of cevitamic acid by Szent-Györgyi (1932), and its possible relationship to a variety of disease mechanisms. The typical cutaneous features of scurvy are the well known tendency to bleed under the surface of the skin, into the gums and buccal mucosa. In milder attacks the skin is first dry and rough, with powdery scaling, and the hair follicles are prominent.

That vitamin C is a factor of importance in skin sensitization, and therefore in the field of allergy, is an opinion born out by recent experimental and clinical evidence. Successful treatment of exfoliating dermatitis caused by neoarsphenamine has recently been reported[4] by the use of cevitamic acid given intravenously. Should these findings be substantiated by further investigation, this vitamin, through its desensitizing properties, will be an important addition in the treatment of many cutaneous diseases based on an allergic mechanism.

An interesting point in this connection of some practical importance is to be found in laboratories for standardization of drugs and biological products (serums, toxins, vaccines, etc.). It has been shown that there is a difference in the reactions of test animals to test materials, and an interference with the standardization of these test materials (Schick and Dick tests for example), according to the Vitamin C content of the diet.

Harris,[5] in his book on "Vitamins in Theory and Practice", states there is little doubt that many eat insufficient vitamin C-containing foods, and suggests that chronic deficiency produces numerous borderline states of ill health.

Rather surprisingly, vitamin D is not known to cause any skin changes.

These brief remarks show that the rôle of vitamins is of considerable importance in dermatology. Apart from the better known manifestations, sub-clinical hypovitaminoses may have a bearing on many skin diseases of obscure etiology.

2. Tuberculosis.—Within the past few years the dietetic treatment of cutaneous tuberculosis has been stressed. Favourable and even striking results have been reported. There is both experimental and clinical evidence to support this type of treatment. By dietary measures the anti-tuberculous power of the skin increases, apparently to the same extent as by exposure to sunlight. Also, there is evidence to suggest that vitamin C is a factor in experimental tuberculosis. McConkey and Smith[6] found that in most of their experimental animals a diet rich in this vitamin prevents the development of tuberculosis.

The principle of this diet is the virtual exclusion of sodium chloride. Sauerbruch, Herrmansdorfer and Gerson were the first to employ this measure and the diet is known under the name of its originators, or, for short, the S.H.G. salt-free diet. The essentials of this diet are as follows: (1) almost complete exclusion of sodium chloride, but a rich content of calcium and other minerals; (2) a large percentage of uncooked vegetables (cooked vegetables should be prepared in their juices in waterless cookers); (3) restriction of meats; (4) raw eggs, milk, butter, and meat juices; (5) liberal quantities of vitamins C and D; (6) high fat and protein content with a low proportion of carbohydrate. The sodium ion appears to be the constituent of common salt which retards healing in skin tuberculosis.

3. Acne rosacea.—Acne rosacea is a disturbance of the small blood vessels (capillaries) of the central, or flush, area of the face. The affected parts are dull red in colour, and œdematous, with increase in the size and the number of the blood vessels. Occasionally lesions appear on the cornea of the eyes, which may lead to the formation of fibrous tissue, and can result in an impairment of vision.

Digestive disturbances have long been recognized as one of the outstanding features of this disease and are important etiologically. These may be induced by errors in diet, in particular from the excessive use of tea, coffee, alcohol and condiments. Symptoms of gastro-intestinal disturbances are present in the great majority of these patients. Many have some degree of hypochlorhydria. From the study of a large number of rosacea patients some observers have estimated that 30 per cent have complete achlorhydria or marked hypochlorhydria.

Dietetic management of acne rosacea is one of the most important measures in treatment. In milder cases a proper dietary regimen by itself is sufficient to effect marked improvement, and sometimes a cure. The principles in this connection are: (1) exclusion of all stimulating foods such as tea, coffee, alcohol, condiments, excess sweets and rich sauces; (2) the diet should be bland, preferably in small quantities at more frequent intervals; (3) excessively hot foods should be avoided; (4) the administration of dilute hydrochloric acid, when indicated; (5) the correction of gastro-intestinal disturbances.

4. Yeast infections (monialiasis). — A wide variety of skin lesions are caused by yeast or thrush microorganisms, and closely resemble ringworm infections. Probably the most common example is *oral thrush* in infants. These organisms flourish best in a moist warm area. They have a predilection for contact surfaces where there is natural warmth and moisture.

The chief interest in yeast infections, with regard to dietetics, is that these infections occasionally are present in diabetics and in patients who are over weight. Although neither hyperglycæmia nor excessive carbohydrate intake are exciting causes they are predisposing factors of importance. To restrict the carbohydrate intake in these patients is good practice, and in every instance diabetes should be suspected and the proper investigation made.

5. Disorders of metabolism.—While adequate quantities of all necessary food factors are of primary importance, one must not overlook alterations in the mechanism of the various chemical processes whereby the body utilizes the foods supplied through diet.

Alterations in carbohydrate metabolism are not known to be the primary cause of any specific skin lesions. Yeast infections, as previously mentioned, and possibly furuncles, may accompany disturbances in carbohydrate metabolism. However, these cannot be attributed directly to increased amounts of sugar in the blood.

Disturbances in protein metabolism result in a number of cutaneous lesions. These are relatively uncommon and require no further comment as they have no known dietetic application.

A series of skin affections result from disorders of fat metabolism; two are of dietetic importance. First is a group of lesions, the *xanthomas,* which may be found either on the skin or involving internal structures. "Xanthoma" is a misleading term since the ending "oma" indicates a tumour formation. The cells of which these lesions are composed are not tumour cells but fat-containing phagocytes. We are interested only in that form associated with diabetes, known as *xanthoma diabeticorum.* In this disease yellowish-coloured papules and nodules may be distributed over a large part of the body. The treatment is largely dietetic, directed to control the associated diabetes. Fat-poor diets have also been recommended[7] with the object of lowering the cholesterol- and fat-content of the blood.

The second disorder associated with fat metabolism is characterized by the presence of bluish yellow tumour-like lesions, which occasionally progress to ulcerations. This rare disease (*necrobiosis lipoidica diabeticorum*[7]) is the result of a disturbance in fat metabolism in which excess fat, present in the blood of diabetic patients, is deposited in the skin. Since these lesions are found in diabetics their recognition is of diagnostic importance. The treatment recommended consists, in addition to insulin and limitation of fats, of suitable dietetic measures to control the hyperglycæmia.

CUTANEOUS MANIFESTATIONS OF FOOD ALLERGY

The occurrence in certain persons of abnormal and unexpected reactions to foods which are harmless to the majority is an accepted fact. These reactions present a problem of interest to all those concerned with practical dietetics and nutrition, including the dietician, pædiatrician, internist, and also the dermatologist when they manifest themselves on the skin. The existence of these unusual reactions has been recognized for many years. Attacks of asthma following the ingestion of milk and coffee were recorded by Salter in 1860.

Reactions of this nature to foods, often referred to as idiosyncrasies, possibly were responsible for the old adage, "One man's meat is another man's poison". It must not be assumed that all the manifestations from foods that disagree with people are allergic in nature. Nevertheless, one is correct in stating that the majority of cutaneous manifestations are based on an allergic mechanism. In a recent paper by Alvarez and Henshaw,[9] credit is given to allergists for advancing our knowledge of this phase of dietetics. Students of allergy became interested in diet when they recognized that various foods

can be the cause of hay-fever, asthma, and skin lesions.

What does the term allergy imply, and when is one justified in designating a reaction allergic? Von Pirquet coined this term in 1906 to describe serum sickness in human beings, and, with Schick, Rosenau and Anderson, established the fundamental features of allergic reactions. That these reactions are not toxic in nature, that they can be produced by extremely small quantities, that they follow a definite sequence of events, and that they are specific for the sensitizing substance, was demonstrated by experiment. For example, the ingestion of egg-white is harmless to the majority of people, but in a small percentage, minute quantities may produce eczema (atopic dermatitis), urticaria, angioneurotic œdema, asthma or hay-fever. These persons are said to be hypersensitive to egg-white. The terms allergy and hypersensitiveness are used interchangeably.

Allergy is defined as a state of altered reactivity caused by contact with a substance, and demonstrated by a different reaction on subsequent contact with the same substance.

Many theories have been advanced to explain the development of these altered reactions. Any detailed discussion of the various explanations would necessitate a lengthy digression. However, one point is worthy of mention—the factor of hereditary influence. Certain persons inherit the capacity to develop more easily allergic reactions than the majority. In this group one finds the hay-fever, asthma, eczema (atopic dermatitis) and migraine sufferers amongst whom there is a distinct familial tendency to develop these diseases. In order to designate these clinical forms of allergy and to separate them from the acquired forms of allergy the term "atopy" has been suggested by Coca. The importance of recognizing this particular group in practical dietetics is that these people are frequently subjects of food allergy. Fortunately, hereditary predisposition applies only to a relatively small number of people. Many competent authorities hold the opinion that the majority of food hypersensitivities are acquired.

The exact incidence of food allergy in the general population is difficult to estimate, and there is no agreement on this point. Rowe,[8] who has contributed a great deal to our knowledge of this subject, estimated that 31 per cent of a group of 400 university students and nurses were sensitive to food. Alvarez and Henshaw,[9] in their study on "Foods that commonly disagree with people", found 3 per cent of the individuals studied unable to eat eggs and 7 per cent unable to drink milk. Hypersensitiveness to milk is a problem of concern to the pædiatrician, and, according to Ratner,[10] is of more frequent occurrence than generally realized.

The cutaneous manifestations of food allergy show wide variation in severity. Principally they consist of: urticaria (hives), angioneurotic œdema (giant hives), eczema (atopic dermatitis), petechial eruptions (purpura), acne vulgaris, and not infrequently various degrees of itching.

1. *Urticaria and angioneurotic œdema* represent variations of the same fundamental disturbance. They are fairly common manifestations of food allergy. These conditions are characterized by various-sized swellings on the skin which tend to be of short duration and present little difficulty in diagnosis. The chronic variety, however, may persist for months or years, one attack succeeding another at short intervals. The chief offending foods in infants are eggs and milk; in adults, eggs, meat (especially pork), fish and shellfish, nuts, tomatoes, and some cereals, particularly wheat. Very often hives may follow the eating of a food for the first time (egg, in an infant), or after foods that are eaten only at intervals, for example, fresh fruits in season. Beverages, principally alcoholic, are not uncommon causes of urticaria.

2. *Pruritus (itching)* without evidence of skin lesions is a frequent complaint. Although the etiological factors are varied, hypersensitiveness to foods always requires investigation. Elimination diets often are of value in the treatment of this symptom.

3. *Purpura* is characterized by an extravasation of blood into the skin and mucous membranes. That purpura can be caused by food allergy was definitely established by Alexander and Eyermann. In this order of frequency the following foods are known causes of purpuric eruptions—eggs, milk, wheat, chocolate, beef, pork, certain fish, onions, tomatoes and strawberries.

4. *Acne vulgaris* particularly affects young adults, mostly at or about puberty, but may continue into early adult life. Dermatologists generally accept foods as one of the relevant factors in this condition. However, now, the

same importance is not given to the restriction of carbohydrates and fats as formerly. Although an excess of these factors is not desirable clinical experience has shown that undue restriction of carbohydrates and fats is not beneficial. Moreover, there is no scientific evidence in support of any alteration in carbohydrate metabolism. These patients, therefore, are prescribed a well-balanced diet sufficient for their requirements.

In so far as diet is concerned, present opinion tends towards the view that the type of diet is not at fault, but rather a sensitivity to certain specific food items. Although hypersensitiveness to any food may develop, the most frequent offenders are chocolate, fish, nuts, white bread, and the salts of bromine and iodine. That eruptions from the ingestion of bromides and iodides can closely simulate the lesions of acne vulgaris is well known. For this and other reasons it is important that these be excluded from the diets of acne patients.

The commonest source of bromides, apart from their therapeutic use, is white bread. Potassium bromate is sometimes utilized as a so-called "baking improver". During the baking process the potassium bromate is converted into potassium bromide. So far as I am aware, "improvers" are not used in the manufacture of whole wheat bread and the reason for excluding white bread, unless otherwise indicated, is as above. The commonest source of iodides is iodine salt.

In addition to an adequate and properly balanced diet, the dietetic management of acne vulgaris requires careful search for, and exclusion of, those foods to which the patient may be hypersensitive.

5. Of all the cutaneous lesions in which food allergy is a factor, *atopic dermatitis* assumes the greatest importance. Under this title are included the childhood type of eczema, and its manifestations in young adults. For various reasons the term "eczema", except in popular usage, at present is applied less frequently to this disorder. Previous mention has been made of the hereditary and familial tendencies in asthma, hay-fever, and migraine (atopic diseases). In this category belongs atopic dermatitis. A positive family history of one or more of these diseases generally is obtained. Frequently atopic dermatitis, asthma and hay-fever coexist in the same patient.

The clinical features in infancy probably are familiar to everyone. In adults the lesions may be generalized or localized, and have a predilection for the face, the neck, the bends of the elbows, and the backs of the knees. The outstanding subjective symptom is itching, which may assume almost intolerable proportions. Except one be a patient oneself it is difficult to have any conception of the discomfort accompanying atopic dermatitis.

Apart from the predisposing factors of heredity, nervous irritability, endocrine disturbances, and so forth, the exciting agents in many instances are foods. This is true particularly in the infantile variety. Sensitization may take place *in utero* by the passage of food allergens through the placental circulation; postnatally, through the mother's milk, or from artificial feeding. When, later on in life, the patient comes into contact with food to which he previously has been sensitized the lesions of atopic dermatitis appear.

The most important foods are eggs, wheat, and milk, although no food is beyond suspicion. Egg is probably the most important because the initial lesions very often appear following the feeding of the first egg.

The diagnosis and the treatment of skin lesions resulting from food allergy is similar to allergic diseases in general. The first and most essential step is a detailed and careful history; the second, skin tests by the scratch method. Foods giving positive test-reactions should be correlated with clinical trial. Treatment consists first, in avoidance of those foods indicated; secondly, in use of elimination diets when offending foods cannot be determined, and thirdly, in desensitization when such a procedure is indicated and previously has shown to be of value.

SUMMARY AND CONCLUSIONS

Briefly to summarize this discussion on the influence of nutrition in cutaneous medicine, mention has been made of the relation of the skin to other organs of the body, and the close interdependence of all structures has been emphasized. Theoretical considerations largely have been omitted, and discussion limited to a few diseases or disease groups in which dietetic factors are specifically indicated, principally those having an etiological relationship. Diseases not having direct or causative bearing on

nutritional errors have been omitted; their dietetic management is regulated according to indications.

The cutaneous manifestations of food allergy have been discussed, a definition of the term given, and those factors constituting an allergic reaction indicated. Hereditary influences on allergic reactions to foods, particularly in atopic dermatitis, were indicated. Most authorities believe the majority of the manifestations of food hypersensitivities to be acquired.

These brief remarks show the subject of dietetics to have an important application in dermatology. Moreover, they serve to illustrate the breadth of the subject of nutrition, and its relation to a wide variety of disease states. With the accumulation of new knowledge, nutrition should be of ever increasing importance in health and disease. Finally, there are many pertinent problems in the study of nutrition which remain unsolved, thus offering wide scope for continued investigation of, application to, and interest in, your chosen field.

REFERENCES

1. FRAZIER, C. N. AND HU, J. N.: Nature and distribution according to age of cutaneous manifestations of vitamin A deficiency, *Arch. Dermat. & Syphilol.*, 1936, 33: 825.
2. LOEWENTHAL, L. J. A.: A new cutaneous manifestation in the syndrome of vitamin A deficiency, *Arch. Dermatol. & Syphilol.*, 1933, 28: 700.
3. MACKAY, H. M. M.: II. Vitamin A requirements of babies: skin lesions and vitamin A deficiency, *Arch. Dis. Childhood*, 1934, 9: 133.
4. DAÏNOW, I.: Desensitizing effect of 1-ascorbic acid (vitamin C), *Ann. de Dermatol. et Syphilol.*, 1935, 9: 830.
5. HARRIS, L. J.: Vitamins in Theory and Practice, Cambridge University Press, 1935.
6. MCCONKEY AND SMITH: Year Book of Dermatology and Syphilology, Year Book Pubs., Chicago, 1937, p. 76.
7. TEMPLETON, H. J. AND CHOURET, E. E.: Xanthoma diabeticorum, *Arch. Dermatol. & Syphilol.*, 1931, 24: 604.
8. ROWE, A. H.: Food Allergy: Its Manifestations, Diagnosis and Treatment, Lea & Febiger, Philadelphia, 1931.
9. ALVAREZ, W. C. AND HENSHAW, H. C.: Foods that commonly disagree with people, *J. Am. M. Ass.*, 1935, 104: 1253.
10. RATNER, B.: The treatment of milk allergy and its basic principles, *J. Am. M. Ass.*, 1935, 105: 934.

CARCINOMA OF THE BREAST IN UKRAINIAN WOMEN*

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THE incidence of carcinoma in its various forms shows a definite variation so far as race is concerned. Among some people it seems to be definitely associated with their habits of living. William J. Mayo[1] says, "The Chinese men eat at the first table, when the rice is hot, throwing it with some force by means of chopsticks into the mouth and pharynx, and not infrequently they suffer from cancer of the pharynx and the beginning of the œsophagus. . . . In the mountain regions of Kashmir, India, where the people carry braziers filled with hot coals strapped onto the lower part of the abdomen, cancer just above the pubes is common." These two quotations might be given as examples of carcinoma associated with a definite race, the partial etiology of which is apparently obvious. In other races there is a relative infrequency of carcinoma for which no explanation is forthcoming at the present time. It is interesting to note that Ales Hrdlicka[2] in discussing disease among the American aborigines makes the statement, "Cancer was rare".

This present study has to do with carcinoma of the breast in Ukrainian women, and in this connection a similar statement might be made. "Cancer of the breast in Ukrainian women is rare." Emil Bogen,[3] of Olive View, California, writes, "Available information from Japan and India and from Chile and Uruguay reveals breast cancer in these countries extremely seldom compared to European countries, while the English-speaking countries report much higher figures."

The Lamont Hospital is contiguous to one of the largest settlements of Slavic people in Canada. In this district those of Ukrainian birth form the major portion of the population. I became associated with Dr. A. E. Archer here in 1922, and in the years following noticed that we had no patients with breast carcinoma among Ukrainian women. (It was not until 1934 that I saw and operated upon the first case.) I discussed this observation with Dr. Archer who has been practising here for some thirty years, and he remarked that he could only recall having seen one case of breast carcinoma in a woman of Ukrainian birth. A more thorough investiga-

* A paper read at the meeting of the Canadian Medical Association, Alberta Division, at Calgary, September, 1938.

tion of this subject was made and the results are published below.

This study covers a fifteen-year period, 1922 to 1936 inclusive, and is presented from three aspects: (1) Our clinical experience in the hospital at Lamont; (2) findings in relation to the province at large; (3) observations suggested by these findings.

From previous investigation we know that 70 per cent of our clientèle here are of Slavic birth. Of this group 90 per cent are Ukrainian. During the fifteen years in question we have examined, in round numbers, 14,500 women over 25 years of age who were of Slavic birth. (Twenty-five years was taken as a minimum cancer-age to be in keeping with figures which will appear later on in this discussion.) In our own experience we have not seen a case of carcinoma of the breast in a patient as young as this. During the fifteen years under review there has been only one case of carcinoma of the breast in a Ukrainian woman. During the same period 6,200 women of cancer age from other nationalities have passed through the clinic here, and from this group we have treated 18 cases of breast carcinoma.

Considering these figures alone, they would suggest that carcinoma was 42 times more frequent among non-Slavic women than among those of Slavic birth. Thus, our figures, for the sake of comparison, are as follows:

Slavic women—
1 case of carcinoma out of 14,500 women.
Non-Slavic women—
1 case of carcinoma out of 350 women.

These figures are from a fairly localized area, and should not be taken as indicating too definitely the Slavic-non-Slavic ratio of breast carcinoma. It is interesting to note however, that when we turn to the larger area of the province the findings are definitely in keeping with the experience here.

Through the kindness and assistance of Doctors Ower and McGregor, of the Provincial Laboratory, I have had free access to their records of breast carcinoma during the fifteen-year period which this study covers. Pathological specimens referred to the Laboratory for examination come from widely separated points throughout the province and may be taken as a fair representation of the status of breast carcinoma in Alberta. Since 1922, 1,390 breasts have been examined in the Laboratory, and of these 431 were carcinomata. Further, of the 431 cases 14 women were of Slavic birth, but only 6 of these were Ukrainian.

Taking the 1931 Dominion Census as the source of our figures, we find that there were 55,872 Ukrainians in the province and 43,942 others of Slavic birth. The grand total of population was 731,605. Distributing the cases of breast carcinoma in the various groups, we have the following results:

1. Ukrainians ..... 55,872, carcinomata 6; 1 case per 9,312.
2. Other Slavs ..... 43,942, carcinomata 8; 1 case per 5,432.
3. Remaining peoples. 631,991, carcinomata 417; 1 case per 1,550.

From these figures it is evident that in Alberta carcinoma of the breast is comparatively uncommon among Slavic women and comparatively rare among those of Ukrainian birth. The figures from Lamont are even more striking—1 case in 13,050 Ukrainian women examined during a 15-year period. It is also worth noting that no case of carcinoma in the male breast has been encountered.

In considering this fact of the comparative infrequency of breast carcinoma among the Ukrainian women it is interesting to note that the Encyclopædia Britannica[4] refers to the Slavs as probably the purest racial entity in Europe today. It is also apparent that the Little Russians or Ukrainians have maintained their racial integrity with a surprising persistence. Resistance to this type of carcinoma may very well be a racial characteristic and of a hereditary nature.

In attempting to offer some explanation as to why Ukrainian women have little breast carcinoma, the fact that they have large families and tend to nurse their children for long periods of time first comes to mind. Emil Bogen, in his article already referred to, summarizes his paper as follows, "Analysis of available vital statistics shows that cancer of the breast is strikingly associated with a low birth rate. Clinical investigation confirms this finding and indicates that it is more particularly related to lack of drainage of the mammary glands. Animal experimentation shows that this is due not to endocrine derangement subsequent to the lack of suckling, but simply to the local retention of secretions in the non-lactating breast. Recent chemical investigation has revealed the existence of chemical substances in the normal breast secretion which may after many years of retention exert carcino-

genic effects similar to those well known to result from the exogenous application of certain coal tars. The results of clinical, biological, and chemical investigation concur with those of the analysis of the vital statistics in emphasizing the etiological rôle of retained mammary secretions in the development of cancer of the breast." C. C. Twort,[5] writing in *The Lancet* says, "It is suggested that the chief etiological factor concerned in cancer of the breast is a group of compounds containing the carbon skeleton of phenanthrene acting in conjunction with oleic or other unsaturated fatty acids".

Evidence has accumulated to leave little doubt that a lactating breast or one which has performed its normal function is less likely to develop carcinoma than the breast which has never lactated, other things being equal. That racial characteristics may also have considerable bearing on the problem is suggested by the following information.

Keeping the consideration of lactation before us it would seem that a study of another racial group in whom large families and prolonged lactation are also characteristics would be both interesting and instructive. In Canada the French-Canadian people form a distinct entity. Their families are frequently large and the babies are nursed at the breast often for quite long periods of time. It would seem logical therefore to study this group more carefully and compare the findings with those given in connection with the Ukrainian women. At the suggestion of Dr. Ower I wrote to Prof. L. C. Simard,[6] of the Department of Pathology, Notre Dame Hospital, Montreal, and with his permission I give a portion of a personal communication. "We have had from 1927 to 1936, during ten years in Notre Dame Hospital 247 cases of cancer of the breast, 193 in married women; 64 were unmarried. The youngest woman who had cancer of the breast was 25 years of age. (This age has already been referred to.) If we take into consideration the number of married and unmarried women who passed in the Surgical Department of the hospital for the same period, married 7,631, unmarried 265, we arrive at the following percentage *for the hospital:* Frequency of cancer for married women, 2.52 per cent, for unmarried women 20.37 per cent. This percentage concerns the hospital only and of course is of little value.

"By taking the census of the Province of Quebec for 1931, census being made every ten years, of women over 25 years of age, (these figures have been given me by the Department of Demography), we have a population of married women 603,708, of unmarried women 125,987. Taking the percentage with the cases of cancer, we arrive at the following figures: frequency of cancer of the breast at Notre Dame Hospital related to the population, married 0.0319 per cent, unmarried 0.0428 per cent. Cancer of the breast is then more frequent in unmarried than in married women.

"One can make another estimate. The proportion of married to unmarried is 4.7 to 1. If we multiply 54 cases of unmarried by 4.7, I should have had 253.8 cases of cancer of the breast in married women. Therefore 60.8 cases of cancer of the breast are missing in the married, showing that cancer of the breast is more frequent in the unmarried than in the married women."

From these figures regarding the French-Canadian women one is justified in making two deductions. Cancer of the breast is more frequent in the unmarried than in the married women, and cancer of the breast is not infrequent among the women of Quebec.

To return to the question under discussion, it would seem that lactation is not the only deterrent to carcinoma of the breast among the Ukrainian women. It may be of value to note that so far as dress is concerned the Ukrainian women seldom make use of corsets, brassieres or any type of breast support. The breast enjoys the maximum of exposure as a result of frequent nursings and loose clothing. Further, these women do a great deal of out-door work in the garden, fields and farmyard. Wm. J. Mayo[1] has called attention on several occasions to the fact that cancer of the breast is comparatively rare among women who leave the breast exposed or wear very little in the way of restricting clothing.

So far as can be ascertained by inquiry and observation there is nothing in the habits of these women, apart from lactation and dress, which might be of any significance. The women of the age-group under consideration belong largely to the immigrant people who came to Canada from central Europe. It will be interesting and informative to follow the younger generation born in Canada. They are growing up adopting our methods of dress and characteristics of family

life. Will this change be accompanied by an increasing frequency of carcinoma of the breast among women whose racial stock is primarily Ukrainian?

SUMMARY

1. Carcinoma of the breast is rare among Ukrainian women.

2. Lactation and habits of dress probably contribute to this state, but there must also be a natural immunity which plays an important part.

3. A further study of the Canadian-born Ukrainian women is suggested.

REFERENCES

1. MAYO, W. J.: Susceptibility to cancer: Collected papers of the Mayo Clinic and the Mayo Foundation, 1930, **22**: 932.
2. HRDLICKA, A.: Medical and surgical diseases among the American aborigines, *J. Am. M. Ass.*, 1932, **99**: 1661.
3. BOGEN, E.: The cause of breast cancer, *Am. J. Pub. Health*, 1935, **25**: 245.
4. RUSSIA: Encycl. Britannica, 13th ed., **23**: 884 and 914.
5. TWORT, C. C.: The e iology of breast carcinoma, *The Lancet*, 1932, **2**: 776.
6. SIMARD, L. C.: Personal communication.

LEAD POISONING FROM "CANNED HEAT"*

BY L. D. WILCOX, M.D., F.R.C.P.(C.)

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THE condition of lead poisoning is always important because of the many ways in which it may be acquired, the varied nature of its symptomatology, and the ease with which its diagnosis can be clinched. Occupations involving lead are responsible for most of the cases in adults. Those met with after the ingestion of lead-containing solids or liquids are rare but no less significant.

These notes are prompted by a study of 6 cases of severe poisoning encountered among alcoholics who made a practice of drinking "canned heat" put up by the Sterno corporation, a product designed for rapid cooking in camps.

As is generally known, "canned heat" comes in small 70 c.c. tins which may be purchased at fifteen cents apiece in hardware or drug stores. It is a pink, jelly-like substance containing denatured alcohol with a wax base. Most consumers strain the contents of one or two cans through a handkerchief. Some dilute the filtrate half and half with water, while others take it straight, with a little brown sugar. While it is true that the use of "canned heat" has fallen off since beer has come in again, we have been surprised at the number of men and women who take this drink steadily; two of our patients have enjoyed it over a period of twenty years.

On investigating we found that no bad effects accrued from the original fractions of the mixture. The danger seemed to lie in the contamination of the contents by lead going into solution from the containers. Analyses of sterno cans and their contents gave the following results. (1) Material from two tins weighing 146 grams contained 7.5 mg. of lead; (2) material from two other tins contained 4.0 mg. of lead. Of this 4.0 mg. there were 2.6 mg. in 130 c.c. of solution, and 1.4 mg. in the 30 g. of solid material. That is, considerably over one-half of the lead present was in solution; (3) a metal sterno container weighing 36.65 g. contained 230 mg. of lead. These analyses were made in the laboratory of the Division of Industrial Hygiene of the Provincial Department of Health. When it is realized that the daily absorption of 1 to 4 mg. of lead over a period of months will produce clinical signs of lead poisoning, and that fatal cases do not often show more than one gram of lead in the entire body, it is at once evident that the continued use of "canned heat" might end in this condition.

CASE 1

W.K., male, aged 41, was admitted with the complaints of dyspnœa, anorexia, nausea, vomiting, pain in the central part of the abdomen, weakness, and a loss in weight of twenty pounds. All the symptoms had increased over a two-year period.

On physical examination the patient was very emaciated; the skin and mucous membranes were pale; dehydration was marked; the sensorium was clouded and it was difficult to get any cooperation; the eyes showed a slow spontaneous nystagmus at times; the pupils were equal and reacted to light; the fundi were normal. The mouth was in a filthy condition and the gums showed a very pronounced dotted blue line. The heart and palpable vessels were not noteworthy; the blood pressure was 138/84. The abdomen was somewhat distended, contrasting sharply with the general state of malnutrition. Neurological examination revealed no gross weakness in any of the muscle groups; sensation for pain was not

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disturbed, and all the deep and superficial reflexes were present and within normal limits.

In spite of supportive treatment and lumbar puncture the patient slipped into coma. Generalized convulsions occurred repeatedly during his stay in hospitaal.

Laboratory examinations.—Blood—Red blood cells, 2.1 millions; white blood cells, 11,250; Hgb., 30 per cent. Smears showed large numbers of stippled cells. Urine—Albumin, 2 plus; non-protein nitrogen, 40 mg. X-ray—Skull and chest normal. The blood Wassermann test was negative. Lumbar puncture showed fluid under a pressure of 300 mm. of water. It had a yellow tinge to it, contained 2 cells; sugar, 91 mg.; chlorides, 680 mg.; proteins, 220 mg. No blood was submitted for spectrographic studies.

Anatomical diagnosis.—Lead encephalopathy; cloudy swelling of the kidneys.

CASE 2

M.K., female, aged 49, a sister of the first patient, complained of abdominal cramps, pain in upper and lower extremities but no paralysis, and weakness, all over a period of several months.

Physical examination revealed marked pallor, a moderate loss of subcutaneous fat and a pronounced blue line along the gums. The heart was normal; blood pressure, 110/76; no abdominal findings on palpation; muscular power was normal. The deep and superficial reflexes were normal.

This patient's pain was never severe enough to require calcium chloride. On a regular diet and iron her condition improved rapidly and she was discharged from hospital, feeling entirely well.

Laboratory examinations.—Blood—Red blood cells, 4.6 millions; white blood cells, 16,000, Hgb., 48 per cent. Smears showed marked stippling in addition to variation in the size and shape of the red cells. Urine—Albumin, 1 plus; occasional pus cells, and 0.098 mg. of lead per litre. Non-protein nitrogen, 53 mg.; spectrographic examination of the blood by Dr. H. Blumberg, of the Johns Hopkins School of Hygiene, showed a heavy lead line. Gastric analysis showed 80 units of free HCl after histamine stimulation. Lumbar puncture, gave a normal fluid under normal pressure.

Both patients had been using "canned heat" daily over a period of years. The sister had only taken it at bed-time "to keep my brother company". Neighbours estimated the money represented by the empty cans thrown out of their apartment prior to their admission to hospital at about fifty dollars.

CASE 3

C.B., male, aged 48, was admitted in semi-coma, having had repeated generalized convulsions. Temperature, 97° F.; pulse, 60. Between seizures he seemed to experience a great deal of headache and had hallucinations.

Physical examination showed much emaciation and moderate dehydration. The pupils were equal and active; the fundi showed no exudates, but the discs were unusually pale. The mouth was very dirty and a heavy blue line was noted in the gums, so heavy that we had no difficulty in photographing it. The heart and vessels were normal; blood pressure, 112/64. Neurological examination was essentially negative.

Laboratory studies.—Blood—Red blood cells, 4.3 millions; white blood cells, 11,950; Hgb., 73 per cent. Smears showed large numbers of stippled cells, and the spectrograph pointed to abnormal amounts of lead. Urine—Albumin, 1 plus, with a positive qualitative test for lead. Non-protein nitrogen, 39 mg. Lumbar puncture revealed xanthochromic fluid under a pressure of 310 mm. of water, with 5 cells, protein 203 mg. and a negative Kahn reaction.

Treatment included repeated spinal drainage, 20 per cent glucose by vein, morphia and hyoscine, sodium thiosulphate, paraldehyde, calcium lactate, and a high calcium diet. The convulsions stopped at the end of a week, but hallucinations continued for more than three months. The patient told us that he had taken "canned heat" over a period of 12 years and that prior to his admission he had been using upwards of ten cans a day. When told of the nature of his illness he stopped drinking alcohol in this form. Now after three years (no deleading measures) he is in splendid physical condition, there are no neurological signs, the mouth is clean, and the blood shows no stippling.

COMMENTS

1. The danger of lead poisoning from the use of canned heat is pointed out.

2. Since lead encephalopathy is a much commoner form of poisoning in children than in adults it seems possible that the combined use of lead and alcohol may predispose to this condition in adults. Four of our six patients presented this picture and three of them died.

3. The third reported patient made an excellent recovery from a severe encephalopathy without deleading measures or adherence to a special diet.

"Men can never become physicians from books, but 'Galen and Hippocrates must be read as fathers and fountains of the faculty'. Lay your foundation in anatomy; read also Vesalius, Spigelius, and Bartholinus; be sure to make yourself master of Dr. Harvey's piece De Circul. Sang., which discovery is preferable to that of Columbus; study plants, animals, the materia medicamentorum; be not a stranger to the useful parts of chemistry, and so by degrees march on. Having learned anatomy, read over two or three times Sennertus's Institutiones, after which you will seldom meet with any point in physic on which you will not be able to speak as a man. See how institutes are applicable to practice, but in reading satisfy yourself not so much with the remedies set down as with the true understanding of the nature of the disease, its causes, and proper indications for cure."—Sir Thomas Browne, *Letters.*

"For the mind depends so much on the temperament and disposition of the bodily organs that, if it is possible to find a means of rendering men wiser and cleverer than they have hitherto been, I believe that it is in medicine that it must be sought. It is true that the medicine which is now in vogue contains little of which the utility is remarkable; but without having any intention of decrying it, I am sure that there is no one, even among those who make its study a profession, who does not confess that all that men know is almost nothing in comparison with what remains to be known; and that we could be free of an infinitude of maladies both of body and mind, and even also possibly of the infirmities of age, if we had sufficient knowledge of their causes, and of all the remedies with which nature has provided us."—Descartes: *Discourse on the Method.*

SPONTANEOUS LYMPHOMATOSIS IN A MOUSE OF THE DILUTE BROWN STRAIN

BY C. S. MCEUEN* AND THEO. R. WAUGH

Montreal

MORTON and Mider[1] have reported the appearance of lymphomatosis in mice of the dilute brown strain obtained from the Roscoe B. Jackson Memorial Laboratory, which followed painting with methylcholanthrene. They observed that (spontaneous) leukæmia has occurred rarely in this strain and never before the animals were eighteen months old. It would therefore seem to be of interest to report the spontaneous occurrence of lymphomatosis which has recently been seen in a mouse of this same strain in the McGill colony.

A large spleen was palpated on March 18, 1938, in a female, 8½ months old, which had not littered. The organ measured approximately 3.5 x 0.5 cm. and weighed 2.227 grams; the liver weighed 3.650 grams. Histological examination showed that both the spleen and liver were infiltrated with immature lymphocytic cells. The spleen of this mouse was transplanted subcutaneously into the right axillæ of three males and five females of the strain. Of these the males showed no transfer, but four females developed generalized lymph gland enlargement and big spleens, and infiltrations of organs were histologically evident, including the liver, spleen, mammary and retroperitoneal lymph glands, and the bone marrow. In 9 males and 5 females of the next passage, lymphomatous infiltration of organs was only demonstrable in three males. Further serial transplantation was attempted in two males and failed. In no instance did a tumour arise locally at the transplantation site, nor was paralysis of the hind legs observed. Transfer to mice of other strains was not successful.

It should be mentioned that no attempt was made to increase the susceptibility of the hosts to transmissible lymphomatosis by x-ray treatment.

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REFERENCE

1. MORTON, J. J. AND MIDER, G. B.: *Science*, 1938, 87: 327.

Case Reports

SEQUESTRATION OF THE ENTIRE MANDIBLE

BY J. L. LITTLE, M.D., F.A.C.S.

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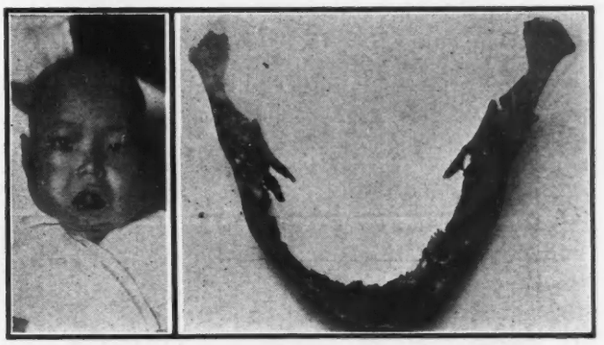
Sequestration through the mouth of the entire mandible intact is deemed sufficiently noteworthy to present as a case report.

(M-38-3479) G.B.P., a Formosan child, aged 6, was presented at the clinic with a complaint of a swollen face and a foul, necrotic piece of bone lying in the floor of the mouth. Four months previously the child had suffered from toothache and a small "gum-boil" at the site of the second right lower molar tooth. After an extraction of this tooth inflammation advanced rapidly until the mouth could scarcely be opened and the right eye was closed. After three days of suffering the swelling began to invade the left jaw as well and it was decided to move him from his home village into the nearest municipal hospital. There an external incision over the right ramus was made to provide drainage, and a quantity of foul pus was evacuated. The father reported that during the ensuing weeks the mouth was very putrid, the gums swollen and spongy, while the teeth seemed to rise up out of the festering tissue. The child ran a high fever, became waxen in colour, and was delirious every evening. He removed many of his loose teeth with his fingers. After a month's treatment with daily irrigations the patient was sent back to the village herbalist in despair of recovery. Slowly the alveolar sockets emerged through the soft tissues, while the upper teeth became disfigured with a dense black film but were otherwise unaffected.

The child was admitted on September 27, 1938, with the tongue pushed up against the palate by a black, jagged, bony mass which moved slightly on pressure, but scarcely any pain was elicited. On the prominent right cheek was a sinus which was discharging thin, serous matter, and through which dead bone could be felt with a probe. At this time the child was afebrile and in quite good health. The urine was normal, the stool free of parasitic ova, and the Kahn test negative. It was decided that the best course of action would be to divide the mandible in the midline and extract the two halves through the mouth.



Under ether-chloroform anæsthesia it was found that the heads of both wings of the mandible could be moved quite readily and it became evident that the mouth would deliver the entire sequestrum without injury to the adjacent tissues. Under gentle pressure and with practically no bleeding the jaw was detached and with-

drawn intact. The after-treatment consisted in daily irrigations with boracic mouth wash and internally "lusil" (Japanese sulphanilamide) 0.5 per diem, was administered. The sinus closed in five days; the boy was able to enjoy his soft diet immediately after the operation, and he began to play about the ward after the third day. He was discharged from hospital on October 7, 1938.

Osteomyelitis of the mandible is a rather common complaint in the more remote sections of this country, where skilled dental care is largely confined to the cities. Usually we are presented with a ragged sequestrum at the bottom of an old discharging, external sinus. Occasionally the face is badly disfigured, with prominent, bulging involucra. In our experience these cases usually progress to a good functional recovery, no matter how alarming the acute stage of the osteomyelitis may appear. It is unlikely that this particular child will ever receive any further attention to his dental needs because of his poverty, but he will undoubtedly be able to handle the rice dietary of the Formosan farmer without great inconvenience.

THE FACTOR OF HEREDITY IN HARE-LIP

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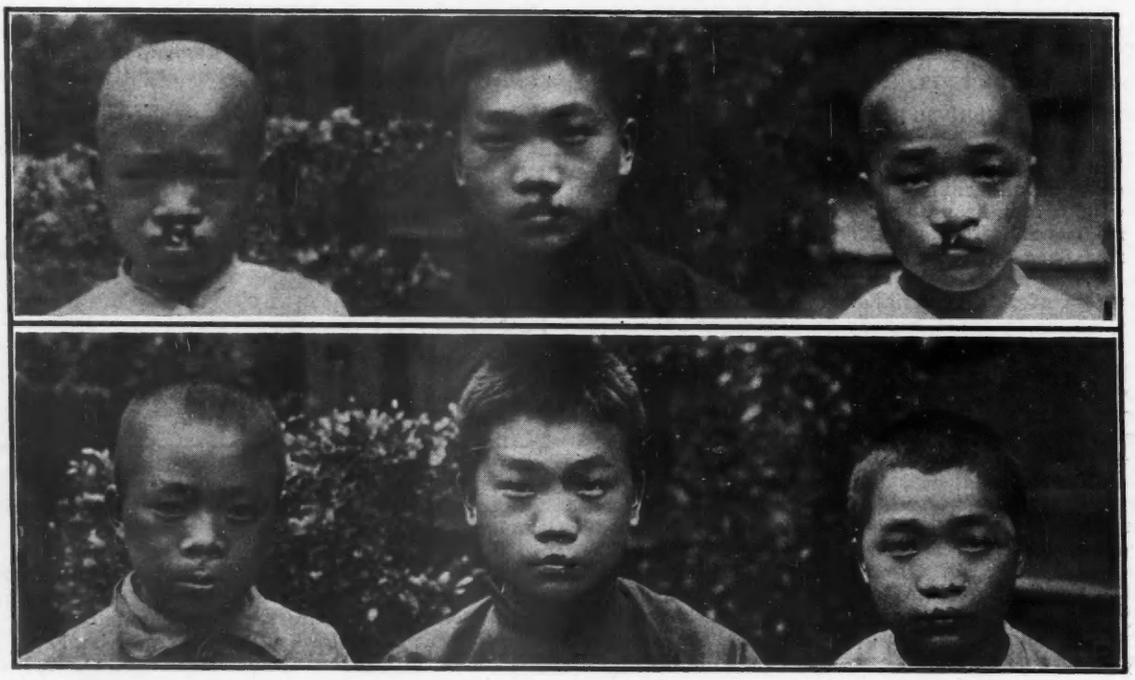
MacKay Memorial Hospital, Taihoku, Formosa

The affliction of five children in one family with hare-lip would on the surface seem to support the familial transmission theory of this defect were it not for the rest of the evidence submitted herewith. In a careful record, supplied from the ancestral tablets back to the great-grandparents on both the paternal and maternal sides of this Chinese family, there was not a single case of hare-lip.

The three lads, K.A.C., K.E.C. and K.T.H. were admitted to the wards of the hospital on October 13, 1938. They were in excellent health apart from their hare-lip deformity. In each case their Kahn test was negative. The father informed us that the family consisted of thirteen children. The first child, a male, with a central hare-lip, died at 6 years of age. The second child, normal, died at 6 years with malaria. The third child, normal, died at 4 years from burns. The fourth child, female, with a hare-lip, alive and well, at present near term in pregnancy, refused to be photographed lest her baby appear with a hare-lip. The fifth child, male, hare-lip (centre in photograph) alive and well. The sixth child, female, normal, died of malaria. The seventh child, male (right in photograph) alive and well. The eighth child, female, normal, alive and well. The ninth child, male (left in photograph) alive and well. The tenth, a normal female, the eleventh, a normal male, the twelfth, a normal female, are all alive and well. The thirteenth child, a normal female, died of malaria. The father and mother are well, active farming people, and quite intelligent. The mother is a bit morose due to the shame over such a misfortune in her family, otherwise bright. The father and mother were free of any defects.

The family history is very interesting. On the maternal side the grandfather and grandmother of the patients were normal and produced 8 children, all free of hare-lip. The boys' mother was the sixth child in this family. The grandparents are still living. The grandparents of the boys, on the paternal side, were normal. Six normal children were born to this couple, the father of the patient being the eldest child. The maternal grandmother's parents were both normal and bore four normal children, the maternal grandmother being the second child. The maternal grandfather's parents were both normal and bore three normal children, the maternal grandfather being the second child. The paternal grandmother's parents were normal, having given birth to four normal children of which the third



was the paternal grandmother. The paternal grandfather's parents were normal and produced 8 children, all normal, of which the grandfather was the second child. The only known defect in the entire double family is a cousin of the patients who is ten years old and is unable to lift himself off the floor, having a type of congenital amyotonia, I would judge from the reports, inasmuch as the child is not mentally retarded to any unusual degree.

Whatever theory of failure of cleft closure can be brought forward to explain these cases would be interesting indeed. The parents are above the ordinary farmer class; they have sufficient nutritious food, and have been well fed for years. Their folk-lore suggests that an embittered ancestor-spirit interfered during the pregnancy because of some fault of the parents. No mechanical, or fetal implant, or cord-in-the-cleft theory appears to fit. One thing does seem evident though, namely, that heredity in this case does not seem to apply.

Therapeutics and Pharmacology

THE DIFFERENTIAL DIAGNOSIS OF GALL BLADDER AND CORONARY DISEASE

By W. Ford Connell

Kingston, Ont.

The diagnosis of disease of the coronary arteries offers no difficulties when the symptoms are referred to the chest. But there is a very considerable group of patients with coronary disease whose symptoms are predominantly abdominal. The diagnostic problem which these cases present is not rendered easier by the knowledge that chronic disturbance of the gall bladder is not infrequently associated with very definite coronary disease. Various explanations have been advanced for this relationship. It is likely that any chronic focus of infection may be of importance in accentuating any coronary disease present and in precipitating actual coronary thrombosis. It is possible, too, that there is a biochemical relationship, in that the lipæmia which is commonly present in cases of chronic cholecystitis with cholelithiasis may predispose to earlier and more extensive atheroma than would otherwise occur. However that may be, the possibility of both gall-bladder and coronary disease coexisting should always be considered. The course of action to be pursued when this combination is found is sometimes an even more difficult question than is the diagnostic problem; fortunately, I am not called on to elaborate this point.

It would appear best first to consider the abdominal symptomatology which may arise in coronary disease *per se*. Long before the average case of coronary artery sclerosis has progressed to the stage of definite thrombosis with cardiac infarction, transient symptoms may arise from time to time, which depend on a condition of relative ischæmia affecting some portion of the coronary circulation, arising under varying degrees of work and exercise, and constituting variants of the syndrome known as angina pectoris. In its classical form this condition is unmistakable, but let us consider the atypical case. Our patient, commonly a healthy-appearing robust male, in his late fifties, who has always enjoyed excellent health, comes complaining of burning pain beneath the lower sternum, associated with a sense of fullness and sometimes pain in the epigastrium and even in the right upper quadrant. There may be a definite inclination to belch and definite relief therefrom. Now, when such symptoms develop on slight exertion following a heavy meal, as is very frequently the case, the suggestion, in the patient's mind at least, is of nothing other than "indigestion". Such a picture, however, all too frequently means that we are dealing with a case of angina pectoris, and careful attention to the history will elicit the undoubted relationship of the symptoms to exertion, particularly when taken soon after food; the definite element of substernal or epigastric *pressure*, or sense of bursting oppression, "as though my clothes were too tight for me", which is even more characteristic of the anginal syndrome than is pain; the prompt relief of the symptoms by rest, and the almost immediate alleviation by nitroglycerin.

If the history be carelessly taken and reliance be placed on physical examination to decide the etiology of the symptoms, grave errors will arise. While it is true that most anginal subjects demonstrate *some* cardiovascular upset, any given case may show little or nothing which would not be expected in anyone of about sixty years. That is, while the blood vessels may be somewhat unduly palpable, the heart will probably not be enlarged, and there will be no murmurs. The blood pressure is not significant. Even the electrocardiogram may be of little help. While changes indicative of coronary damage may usually be demonstrated, particularly with symptoms of some duration, a good 25 per cent of anginal subjects may progress to a dangerous stage of their disease and may even develop a definite thrombosis before

* A paper read before the Association of Clinical Surgeons of Canada, October 14, 1938, at Kingston, Ont.

indubitable evidence of coronary sclerosis is obtainable in their cardiogram. We are not concerned so much now with the confusion which may arise in this, what may be termed, premonitory phase of coronary disease, except to emphasize that any history of "indigestion" must be carefully analyzed before deciding that the symptoms complained of are truly of gastro-intestinal etiology.

We now approach the problem of actual coronary thrombosis with resultant cardiac infarction. There are three surgical conditions of the upper abdomen which most frequently simulate coronary disease. They are *perforated gastric ulcer, hæmorrhagic pancreatitis,* and *gall-bladder disease.* Since pain is an outstanding feature of all these conditions, it will be necessary to analyze it in detail. The pain of coronary occlusion is usually felt somewhere beneath the sternum, and is accompanied by an intense sensation of oppression; it may quite frequently, however, be entirely confined to the upper abdomen and some of the more characteristic radiations—to one or both arms, up into the side of the neck, etc.—may be lacking. Accompanying the pain is usually a very marked degree of *shock.* It is a commonly held opinion that acute pancreatitis produces great shock, but the intensity of the shock and collapse does not approach that seen in coronary thrombosis, that is, of course, when the thrombosis is of sufficient severity to actually simulate an upper abdominal disaster. In coronary thrombosis, too, rigidity of the upper abdomen is comparatively slight, and no such marked localized points of tenderness are found, as is the case over the gall bladder in disease of that organ, or in the epigastrium in acute conditions of the stomach or pancreas. *Pain, pallor* and *rigidity* may be said to constitute the chief features of most upper abdominal emergencies, while *chills* are a common and important feature of acute gall-bladder attacks. In acute coronary attacks, on the other hand, we see *pain, ashy cyanosis* and *collapse.* A cardinal point in differentiation may be said to be the invariable presence of some evidence of *left ventricular failure* in the coronary case. The chief symptom to which this event gives rise is progressive *dyspnœa,* so that the patient can no longer lie horizontally in comfort, but must be propped up almost upright at times in order to breathe with ease. Accompanying the dyspnœa will be the development of moisture at the lung bases. All too frequently there is progression of the failure and development of acute pulmonary œdema, with the copious expectoration of blood-tinged frothy sputum. This whole picture is in sharp contrast to our abdominal patient. Here the breathing may be rapid on account of the pain, but the patient lies flat in bed. Auscultation of the lungs moreover reveals no incipient œdema of these organs.

It might be noted that there is an occasional patient who, following a cardiac infarction which involves the right ventricle, may proceed to develop congestive failure, and may predominantly manifest the signs of such failure in the portal circulation with an enlarged and tender liver, and definite jaundice, associated with nausea and vomiting. Such a picture is much commoner in chronic rheumatic heart disease, constrictive pericarditis, etc., than following coronary thrombosis. Certainly, its occurrence in any heart condition should not often lead to a mistaken diagnosis of primary hepatic disease, since, with such a grave state of the circulation, there will certainly be abundant evidence of serious damage on examination of the cardiovascular system itself.

Nausea and *vomiting* are symptoms which deserve some consideration. Besides their frequent occurrence in congestive failure, involving the portal circulation, as has been noted, they are seen at times as a manifestation of the acute coronary attack, although here the large doses of morphine used or the occasional injudicious over-administration of digitalis (which is actually rarely indicated at all in thrombosis) may be held largely responsible. We may say that nausea and vomiting always favour the diagnosis of a lesion below the diaphragm, however. Still better evidence of an abdominal etiology is afforded by the symptom of *persistent hiccough,* a symptom which is excessively rare following coronary thrombosis, although it may result from such a thoracic insult as extensive pulmonary infarction with diaphragmatic pleurisy.

We are now in a position to consider those points which will commonly establish a correct diagnosis of coronary occlusion: (1) the history —by far the most important single piece of evidence; (2) the great preponderance of the condition in males; (3) the electrocardiogram, which is invaluable in nearly every doubtful case in confirming or disproving our tentative diagnosis; (4) a falling blood pressure; (5) dyspnœa, of true cardiac type; (6) signs of cardiac insufficiency (all degrees from râles at the lung bases to acute pulmonary œdema); (7) a localized pericardial friction rub, a sign which is present only in 35 per cent of all cases; (8) an ashy, cyanotic pallor, which is quite characteristic when present; (9) a marked leucocytosis, without, however, an Arneth shift to the left.

The past history in a case of coronary thrombosis may indicate that definite angina was present for sometimes a matter of years before the severe attack; this is of course helpful. Even if the history is just as certainly indicative of gall-bladder disease this fact should not be allowed to influence unduly our decision as to the nature of the severe seizure. Witness a recent example:

CASE 1

A male diabetic of 56 had had gall-bladder symptoms for several years and was actually in hospital recuperating from an attack of acute cholecystitis, when he was seized with intense epigastric pain, which radiated along the right costal margin. The upper abdomen was somewhat rigid. A diagnosis of gall-stone colic was made by the intern, but when I saw him half an hour later I was struck by the degree of shock and dyspnœa present. The electrocardiogram was pathognomonic of coronary thrombosis. He made an excellent recovery after a stormy week, and his gall bladder has never since bothered him, although he notes substernal oppression on slight effort.

The fact that coronary thrombosis is very much commoner in males than in females is of course of little help in any given case. It is helpful to know that this condition is rare in either sex in the forties, at a time when gall-bladder disease is most prevalent, and that in younger subjects an evident cause for early cardiovascular disease is commonly present, such as diabetes, or else some septic focus, which as a matter of fact may very well be the gall bladder. When coronary thrombosis does occur in females, they are nearly always definitely hypertensive subjects, in their late fifties, with quite evident cardiovascular trouble. The drop in pressure following the attack may of course mask the previous hypertension, but commonly the pulse pressure falls disproportionately to the diastolic, and we are likely to see a blood pressure like 154/110. (This patient's previous level was 220/120.)

The search for some evidences of heart muscle insufficiency should be carefully carried out in the doubtful case. It is rare that at least a few râles are not audible at the right lung base, and this will certainly be so if portal congestion gives rise to puzzling liver signs.

I have not spoken fully of any cardiac signs pointing to thrombosis. As a matter of fact there may be none, the heart being normal or only slightly enlarged in most cases, and there being usually no aberration of rhythm. A localized pericardial friction rub may be found in most cases in which the infarction has occurred on the anterior wall of the heart, but it is a transient development, coming on a few hours after the seizure, and sometimes only lasting a few hours, and it is usually overlooked.

There remain to be mentioned two adjuvant methods of diagnosis, the x-ray and the electrocardiogram. The former is of course most useful in confirming a diagnosis of gastro-intestinal or gall-bladder disease. The latter is invaluable in the doubtful coronary case. With the availability of good portable machines, and with the introduction of the præcordial or chest lead this diagnostic procedure has become even more valuable. In many cases of thrombosis the first record obtained will be pathognomonic; the tracing is practically never normal, and where changes at first are not characteristic serial records, several days apart, will nearly always clinch the diagnosis.

The objection may reasonably be raised that the electrocardiogram loses much of its value in coronary thrombosis from the fact that it is possible to obtain an almost normal record in some cases soon after an attack. I would reply that the cardiogram should never be considered the most important element, but should always remain secondary in importance to the history and clinical features. If so considered, a single negative or doubtful record will not lead one astray. Moreover, in cases which prove to be other than cardiac, the symptoms have generally been such that a normal record would be inconceivable were the symptoms under investigation actually due to coronary occlusion. To cite a case in point:

CASE 2

A male, aged 60, gave a history of attacks of epigastric pain, and of flatulent dyspepsia, at the age of 56, for which cholecystectomy and appendicectomy was performed. The gall bladder was found badly diseased but contained no stones. The dyspepsia had continued after the operation and in the few months before my consultation he had had half a dozen severe attacks of epigastric pain, lasting from 2 to 12 hours. This pain did not radiate, but was accompanied by sensations of chilliness. There was no collapse or dyspnœa. Clinically speaking, the attacks suggested gall-stone colic rather than coronary thrombosis. Examination of the heart was essentially negative and the cardiogram was normal. Operation revealed no less than nine stones in the common duct.

This case brings out, too, the importance of chills as a symptom of gall-stone colic. I might here mention also a sign which may sometimes be of value since, when present, it is indicative of acute gall-bladder disease. This is the so-called Ewald's area of cutaneous hyperesthesia on the right lower portion of the back just internal to the posterior edge of the scapula, over the course of the 10th and 11th intercostal nerves. I hasten to add that its absence does not negate the diagnosis.

I should like at this point to remind you of a truism. More wrong diagnoses are made through not seeing than through not knowing. Granted a given possibility is seriously considered, it is seldom that definite evidence for or against cannot satisfactorily be obtained. Nowadays the chances of coronary occlusion being overlooked for this reason are very slight indeed; we rather tend to lean over backwards in our anxiety to diagnose it, and are really too prone to see it when it isn't there. I do not need to point the grave injustice of such a wrong diagnosis if it is persisted in.

The greatest danger. however, lies in the reverse mistake, the patient being tagged with the diagnosis of an upper abdominal condition when the symptoms are really those of coronary occlusion. This danger is greatest when both gall-bladder and cardiac disease are combined, as in a recent case:

CASE 3

A female, aged 57. First attack of cholecystitis 12 years ago; flatulent dyspepsia since. Definite but slight substernal distress on exertion for two years. Severe epigastric pain and *oppression* with pain radiating down the inner aspect of both forearms to wrists on September 19th. This was considered by the patient a flareup of her gall-bladder trouble, but was regarded seriously by her physician and the symptoms relieved in two hours by morphine. Twenty-four hours later, on my examination, she was pale but feeling well. She complained of aching pain in the back. The heart examination was essentially negative. Her blood pressure was 154/108. There was deep gall-bladder tenderness. The electrocardiogram was pathognomonic of coronary thrombosis. The patient died twelve hours after a second attack, one week later. In this attack the pain was all referred to the back in the region of the right scapula. The striking features were the extreme shock and the marked dyspnœa.

I do not think any credit is deserved for the correct diagnosis in such a case as this. But many such cases of combined disease are much less clean-cut. At such times, the keenest diagnostic acumen may be none too keen.

Any general statement of opinion regarding the treatment to be adopted in the event of gall bladder and coronary disease being found to coexist, is almost valueless. It should be remembered that gall stones are really very commonly present, and are in many cases "silent". Only when we have irrefutable evidence of their contribution to the symptomatology, or of the association with active infection of the gall bladder, should operation be considered. The risk of such an operation in a patient with serious coronary disease is very considerable indeed. There are undoubtedly some patients with angina and associated conditions in whom the benefits from cholecystectomy will definitely outweigh such risk. Once coronary occlusion has eventuated, the risks of operation are still greater, and in some cases at least the procedure might be likened to the well known practice of locking the stable-door after the horse is stolen. At this point, we might leave the discussion, with the full realization that the last word has not yet been said.

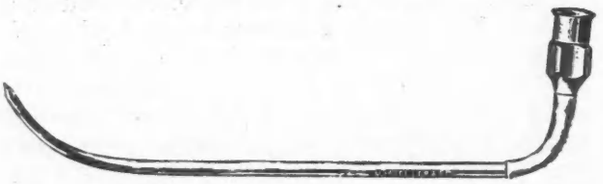
Clinical and Laboratory Notes

A NEW METHOD OF ANTRUM LAVAGE

BY W. S. HUNT, M.B., F.A.C.S.

Sarnia, Ont.

For years it has been the common practice among rhinologists to puncture the maxillary sinus by means of a trocar passed under the anterior end of the inferior turbinate. These trocars vary in size and shape, from a slim straight needle to a heavy curved trocar with the calibre of an ordinary lead-pencil. The large trocars were later supplanted by the antrum trephine which removed a small button of bone under the inferior turbinate to allow the passage of a blunt irrigating cannula.



Any of these procedures worked well in some patients, but in the majority of cases, especially where punctures were repeated, the patient soon developed an aversion to the treatment because of the discomfort arising from the difficulty of anæsthetizing the area under the turbinate. There is also an inherent dread of having the bone pierced. Even the introduction of a blunt cannula through the bony wall after a trephine operation, may be dreaded by a sensitive patient.

The special cannula which V. Mueller and Company, Chicago, made to my design (see Fig.) overcomes the above difficulties in most cases. It is made of stainless steel with reinforced shank and a dull point. The purpose of this special cannula is to provide easy access to the antra-nasal wall *above* the inferior turbinate. It is so shaped that in many cases one can introduce it through the natural ostium, (or an accessory opening) but, if not, it is a simple matter to puncture the membranous wall in that region without shock to the patient and without causing any pain, because the area is, as a rule, easily anæsthetized by a curved applicator or a pledget of absorbent cotton dipped in cocain solution. By inquiring of those patients in whom I have done both the ordinary bony puncture below the inferior turbinate, and later a puncture through the membranous antra-nasal wall above the inferior turbinate, I learn that the latter procedure is usually much preferred.

Editorials

THE RESUSCITATION OF THE APPARENTLY DROWNED

THE season is now approaching when we shall be again confronted with a distressing series of drowning accidents. Much attention has been directed to the automobile accident; not so much to the drowning accident. In the matter of prevention the human element has to be considered in both. Ignorance, carelessness, foolhardiness, physical ailment, all play their parts, and, human nature being what it is, it is hardly likely that these factors can be eliminated to any appreciable extent. This leaves us with the question as to what can be done to save life in the face of a potential drowning case. Here the doctor and the first-aid worker come into the picture. It is essential that both of them should be conversant with the latest and best ideas that have been developed.

It is safe to say that the first thought of the life-saving worker is to initiate artificial respiration. So far, so good, but is sufficient thought given to the details of this procedure, attention or inattention to which will make all the difference in the result? Again, is artificial respiration carried out long enough? A common practice is to continue the procedure for an hour or two and then if the heart sounds cannot be heard with the stethoscope to pronounce the patient dead. This we submit is rather perfunctory. There is excellent authority for the statement that artificial respiration should be carried out for many hours if need be, and not discontinued *until rigor mortis has set in.*

This most important subject was brought to the attention of our Association at the annual meeting in June, last year, when Dr. Gordon Bates, of Toronto, gave an earnest and arresting address which immediately went home. At a meeting of the incoming Executive, held a day or two after, the following resolution was passed.—

"Whereas it has been brought to the attention of this Association that methods of resuscitation in cases of apparent death from drowning, electrical shock, carbon monoxide poisoning and other conditions are often inadequate and are given at a time when there is still a chance of recovery: And whereas there is evidence that long-continued resuscitation will produce a larger percentage of recoveries:

"Therefore be it resolved that a summary of this evidence be published in the *Journal* as soon as possible, and be transmitted to all Divisions and Branches of this Association in order to give the subject widest publicity among the medical profession."

In conformity with the spirit of this instruction the *Journal* published in its August issue a paper by Drs. Bates, Gaby, and MacLachlan, members of the Committee on Artificial Respiration, Health League of Canada, which developed the matter farther.[1] This paper is a plea for the more prolonged application of resuscitation measures, and endorses the recommendation that if restoration is not quickly effected artificial respiration should be kept up until rigor mortis sets in. Rigor mortis is the most convincing proof that death has ensued; the stethoscope is *not reliable* in these cases. The authors make the remarkable statement that "It is possible for a person to have been under water for up to half an hour and still live." Three instances are cited. The lesson is obvious.

And now comes a paper, also of first-class importance, dealing with the experimental side of the subject.[2] It appears in this issue of the *Journal* and deserves the attention of all our readers. Coming from workers at the Banting Institute, it is authoritative. Such subjects as the respiratory and swallowing reflexes, reflex laryngeal spasm, blood pressure, CO_2 content of the blood, the condition of the heart, lungs and stomach post mortem are subjects dealt with scientifically; also, the possible curative effects of various drugs and mechanical procedures.

1. BATES, G., GABY, R. E. AND MACLACHLAN, W.: The need for prolonged artificial respiration in drowning, asphyxiation and electric shock, *Canad. M. Ass. J.*, 1938, **39**: 120.
2. LOUGHEED, D. W., JANES, J. M. AND HALL, G. E.: Physiological studies in experimental asphyxia and drowning, *Canad. M. Ass. J.*, 1939, **40**: 423.

These authors conclude as follows. "As a result of our experiments we consider that *prompt, adequate* and *prolonged* artificial respiration is the fundamental treatment for drowned, asphyxiated or electrocuted persons." The italics are ours. Every adjective deserves close consideration.

It may be added that in the case of artificial respiration manœuvres seconds count. To interrupt the movements even momentarily may spell failure. The mouth and air passages should be cleared as far as possible of foreign matter, and to ensure a free passage for the air on account of the laryngeal spasm so frequently present, a semi-rigid tube should be passed through the larynx. The body should be placed in a semi-prone position, with the head turned to one side and somewhat lower than the rest of the body. Appropriate resuscitation exercises should then be instituted.

Lougheed, Janes and Hall have tried a number of drugs, including adrenalin, nicotine, amyl nitrite, and the mixture of CO_2 and O_2 known as carbogen, for the resuscitation of drowning animals. They think that carbogen is very valuable. The only other agent that need be used is amyl nitrite, which may be given from "perles" and administered during the inspiratory phase of the artificial respiration movements. Adrenalin appears to be positively dangerous.

Such studies as these are of the utmost value, and we may confidently expect that strict attention to the lesson of the findings will result in the saving of many more lives in the future.

A.G.N.

MODERN CONCEPTS IN STREPTOCOCCAL EPIDEMIOLOGY

BRADLEY[1] in a series of papers has called attention to the fact that clinical practice has lagged behind in the application of certain new principles which have evolved in the past decade concerning the understanding of the spread and control of streptococcal infections. Exceptions to this are puerperal sepsis, against which the obstetricians have successfully waged war, and milk-borne streptococcal epidemics, the general acceptance of which has perhaps overemphasized their frequency, for, although a common offender, milk cannot be considered as the main source of the spread of streptococcal infections.

The first of the new principles which must be clearly understood is that the commonest pathogenic streptococcus is the hæmolytic *S. pyogenes,* the human pathogens of which fall in the majority of instances into one group, Lancefield's group "A". Further, this group has been subdivided by Griffith[2] into about 30 types and it is now possible in specially equipped laboratories to identify a streptococcus as belonging to one or another of these types. Armed with this knowledge, the epidemiologist has become aware that scarlet fever is not caused by one type alone but by several whose frequency varies. In other words scarlatina is not regarded as a specific disease wholly unrelated to other streptococcal infections but merely as the manifestation in a susceptible (Dick-positive) individual of the effects of the erythrogenic toxin which some strains produce in high titre. In any given streptococcus epidemic a single strain may produce scarlet fever, tonsillitis, cellulitis, sinusitis, otitis, meningitis, erysipelas, septicæmia including puerperal sepsis and in fact all forms of streptococcus infection. The problem therefore in its widest sense embraces the study of the method of spread and control of all streptococcal infections and not only of those three or four notifiable by law. Isolation of these is highly commendable, and their occurrence is a useful indicator of the existence of streptococcal disease in a community, but until further steps are taken to deal similarly with other sources of streptococcal infection they must of necessity be ineffective.

Detailed investigations carried out in semi-isolated communities—the home, the general hospital, and school—indicate that droplet infection is the main source of spread. Smaller or larger epidemics may occur at intervals due to the introduction of

1. BRADLEY, W. H.: *Guy's Hosp. Rpts.*, 1937, **87**: 372; *Brit. M. J.*, 1938, **2**: 733; paper read before the Royal Sanitary Institute, Cambridge, November 4, 1938.
2. GRIFFITH, F.: *J. Hygiene*, 1934, **34**: 542.

a new strain either from a streptococcal infection or a carrier of a different type. The temporary carrier-state following recovery from an acute infection appears to be more important than the chronic carrier with a sinus infection. A most interesting observation is that clinical differences in the appearance of the tonsils and nasopharynx may be observed with infections from different types of streptococci. This should give the clinician an added zest in examining and making notes on the appearance of individual sore throats, as his experience may ultimately lead him to distinguish between the types commonly found in his vicinity, or at least be able to hazard a guess that because this year's throat picture is different from last year's he is likely dealing with a different type of organism. If the bacteriologists would cooperate by using a blood agar medium for culturing routine *Coryn. diphtheriæ* throat swabs, a medium on which it is possible to identify *mitis* and *gravis* colonies of *Coryn. diphtheriæ* as well as hæmolytic streptococci, the time might come when some of these streptococci could be typed and the clinician have the satisfaction of knowing that the different throat appearances were actually associated with different types of streptococci.

The control of streptococci infections now centres in this fact, that one is not dealing with an army composed of similar individuals but with at least thirty guerilla bands each different in the immunological response it calls forth. Isolation should be extended to include all streptococcal infections including wounds, but the greatest problem concerns the control of droplet spread. How may this be approached in the light of present knowledge? To begin with bacteriological examination has revealed that these organisms may be readily recovered from a zone surrounding the patient while the rest of the room may be uncontaminated. This forms the basis for the avoidance of close contact by visitors, who should refrain from shaking hands or sitting on the bed or near it, and in the home itself bedfellows should be separated and twin beds more widely spaced. Sufferers from respiratory infections should be excluded from crowded gatherings, under which conditions the flora of the throats of different individuals is freely exchanged. The value of adequate masks has been frequently proved in surgical technique, and obstetricians are now well aware of this preventive measure. As Phillips[3] graphically points out, one no longer encounters the paradoxical spectacle of a long-standing perineal laceration being sutured by a fully masked surgical staff while a recent tear is repaired by an unmasked accoucheur. Europe is now experiencing widespread practice in the use of gas masks for a potential danger, why hesitate to employ masks of a simpler design for a really existent danger? As far as sterilizing the air of its contained pathogenic cocci is concerned ultra-violet radiation has been tried with some success and has been employed in an operating room around the field of operation. Its use will undoubtedly be extended.

As a further justification for a more organized attempt to control the spread of pathogenic streptococci one has but to recall that other dreaded diseases, *e.g.*, rheumatic fever and nephritis, are probably in equal measure indicators of the presence of streptococcal infection, and, no matter what their exact etiology may prove to be, scrupulous avoidance of an acute respiratory infection is the best prophylaxis for controlling the progression of these diseases in the body.

ARNOLD BRANCH.

3. PHILLIPS, M. H.: *Brit. M. J.*, 1938, **1**: 1.

PERNICIOUS ANÆMIA.—Sturgis reviews the findings in one thousand cases of pernicious anæmia seen during the past eleven years at the Simpson Memorial Institute. There are seven points of diagnostic significance: achlorhydria, macrocytosis, high colour index, the response to potent anti-pernicious anæmia therapy, paræsthesia, glossitis, leucopenia—or the absence of leucocytosis. Splenomegaly is rare. The most effective treatment is probably by the intramuscular administration of liver extract. There is a possible, but unproved, danger that in using the highly refined products some substances may be eliminated which are beneficial to the patient; crude extract contains the entire vitamin B complex.—Sturgis, C. C.: Remarks on differential diagnosis and treatment of pernicious anæmia, *Bull. N.Y. Acad. Med.* Abs. in *Brit. M. J.*

Editorial Comments

Sir Robert Philip

Sir Robert William Philip, who died on January 25th, was a son of the manse, educated at the Royal High School and the University of Edinburgh. Taking an Arts course first, he graduated with honours in Medicine in 1882 and was awarded a gold medal for his M.D. thesis. After a period of residence in the Royal Infirmary he proceeded to post-graduate study in Leipzig, Vienna and Berlin. Appointed assistant to the professor of practice of physic in the University, afterwards assistant physician to the Royal Infirmary, full physician and professor of tuberculosis, he took his place as one of the most attractive teachers in the Edinburgh School of Medicine. As a speaker he possessed great gifts. His sonorous voice and slow but unhesitating enunciation, combined with a remarkable sense for *le mot juste*, made him an ideal lecturer and an able after-dinner speaker. As the chairman of a committee he was unmatched, and those who, like the writer, remember his gracious, tactful and humorous conduct of business were not surprised when he held with rare distinction posts such as president of the Royal College of Physicians of Edinburgh, president of the British Medical Association, and chairman of the National Association for the Prevention of Tuberculosis. It is, however, in the realm of advance in the diagnosis, prophylaxis and treatment of tuberculosis that his name will always be recalled. As orginator of a scheme of dispensaries where contacts in cases of tuberculosis were examined and followed up he will take his place among the very great in the hall of fame. The first step in his program was the establishment of the Victoria (Jubilee) Dispensary for Consumption in 1887. This was followed by the Royal Victoria Hospital for Consumption at Inverleith and the Farm Colony at Liberton. The tuberculosis dispensary idea was taken up by France in 1902 and by London in 1909. It is now universally acknowledged as a necessary part of any comprehensive scheme for dealing with the white plague. No congress on tuberculosis was complete without his presence. His collected papers on the subject were published in 1937 and form a bulky volume. Philip was not only a great physician and teacher but had in many ways the mind and qualities of a statesman, and had he sought the wider field of political life he would undoubtedly have shone there. He was in addition an artist in language, in the written word, and in appreciation of the beautiful in life, as all who enjoyed his hospitality can testify. We might say of him what Carlyle said of Sir Walter Scott at his death, "A gifted spirit is wanting from among men. He has played his part, left none like him or second to him."

JAMES MILLER

The Visit of Professor Cathcart to Canada

We are informed that Professor E. P. Cathcart, Regius Professor of Physiology, University of Glasgow, will give an address on June 14th at the Annual Meeting of the Canadian Public Health Association to be held in Toronto during the week beginning June 12th. He is down for a public address on "Food and nutrition" on June 19th in Montreal, and will also present a paper at General Sessions of the Canadian Medical Association at the Annual Meeting.

His record is as follows. Edward Provan Cathcart, C.B.E., M.D., D.Sc., LL.D.(St. And.), F.R.S., F.R.S.(Edin.). War service, 1914-1919; Lt.-Col. R.A.M.C. Member of the Army Hygiene Advisory Committee since 1919; Medical Research Council (Privy Council) 1924-1929; Agricultural Research Council (Privy Council) 1931 on; Advisory Committee on Nutrition, Ministry of Health, 1930 on; General Medical Council, 1933 on; Technical Committee on Nutrition, League of Nations, 1935 on; Advisory Committee, Nutrition of Workers Ind. Labour Office, 1935 on; Economic Advisory Committee on Nutrition in the Colonial Empire, 1936 on; National Advisory Council (Scotland) Physical Training, 1937 on; Chairman, Industrial Health Research Board, 1933 on; Chairman of Departmental Committee on Health Services (Scotland) 1933-1936; Member of Council of the Royal Society, London, 1930-1932.

Professor Cathcart's visit is awaited with keen anticipation.

A.G.N.

Corrigenda

Dr. I. M. Rabinowitch has called our attention to an error which appeared in his article entitled "A case of diabetes mellitus with marked cholesterolæmia and signs simulating cerebral thrombosis" (*Canad. M. Ass. J.*, 1939, **40**: 257). On page 257, second column, line 31, the word "hyperglycæmic" should read "hypoglycæmic".

In connection with the article entitled "Comparative chemotherapy in experimental pneumococcal infections", by Drs. Greey, MacLaren and Lucas (*Canad. M. Ass. J.*, 1939, **40**: 319), the footnote states that this paper emanated from the Departments of Surgery and Urology, Toronto General Hospital, of Pathology and Bacteriology, and of Medical Research, University of Toronto. The reference to the Departments of Surgery and Urology, Toronto General Hospital, is incorrect. We regret the error.

Special Article

DIET AND NUTRITION

NORMAL NUTRITION*

BY L. H. NEWBURGH

Professor of Clinical Investigation, University of Michigan, Ann Arbor

XV.

People have always believed that instinct and appetite could be relied upon to guide them in the proper choice of food, but recently the chemists, being skeptics, put the matter to the test. They soon discovered that neither man nor animal possesses any hidden power that permits him to select what he needs to keep him in a healthy state or to reject what is harmful. However, the very active investigation of this question has revealed what food materials must be eaten to produce a healthy body and an active mind. Of equal significance is the striking fact that many diseases, such as rickets, scurvy, pellagra, beriberi and goitre are caused directly by eating too little of certain substances. More subtle are the penalties of over-indulgence. We are just now beginning to realize that certain common diseases of middle life are caused by eating too much. The factors that need to be particularly considered in order to assure an adequate diet are calories, protein, the vitamins, and some of the minerals, especially calcium and iodine.

Usually the caloric intake is regulated automatically by the appetite, although many children eat too little to meet their very large demands for energy; and obesity is far too prevalent among middle-aged persons who eat too much.

The habitual food of large groups of people contains far too little protein. Thus, in the south central portion of the United States, especially in the mountainous districts, the food consists chiefly of corn, molasses and salt pork. The natives are thin, pale, haggard, devoid of ambition, and lacking in strength. It is characteristic that they accept their debility as a matter of course and evince no interest in overcoming it. Even though they are suffering from a protein deficiency instinct does not prompt them to seek out protein-rich foods. Nevertheless, the following table makes it clear that it is a simple matter to obtain a sufficient amount of protein.

It is self-evident that normal growth and development are dependent upon an intake of sufficient and proper materials in the form of food. The younger the child, the more important this question becomes, for growth is most rapid in the earliest years. The normal baby trebles its weight during its first year. It grows even more rapidly during the three months before birth. Since its food comes to it from its mother during this early period her diet largely determines the physical condition of her baby. Bones, whose chief constituent is calcium phosphate, cannot be formed unless an adequate supply of calcium and phosphorus is being absorbed from the digestive tract. Fortunately, phosphorus is plentiful in so many foods that no special thought needs to be directed towards obtaining enough of it. The situation is just the opposite in regard to calcium since its occurrence in most foods is small as compared with the considerable amount required. Sherman, who has made many noteworthy contributions to this subject, insists that the growing child should receive at least one gram of calcium every day.

TABLE I.

SOURCES OF PROTEIN

Amount of food that contains 60 grams

Food	*Amount*
Meat	⅔ pound
Fish	⅔ "
Poultry	⅔ "
Eggs	8
Milk	2 quarts
Cheese, Cheddar	½ pound
Cheese, cottage	⅔ "
Beans, navy, dry	⅔ "
Beans, soy, dry	⅓ "
Peas, dry	⅔ "
Bread, white	1½ pounds

TABLE II.

SOURCES OF CALCIUM

Amount of food that contains 1 gram

Food	*Amount*
Milk, whole	1 quart
Buttermilk	1 "
Milk, skim	1 "
Cream, 20%	1 "
Cheese, Cheddar	3 ounces
Cheese, cottage	3 pounds
Beans, dry	1½ "
Watercress	1 pound
Chard	1½ pounds
Dandelion greens	2 "
Cabbage	5 "
Lettuce	5 "
Bread, whole-wheat	4 pounds
Bread, white	8 "
Corn meal	12 "
Eggs	20
Beef	22 pounds

* An address given under the auspices of the Association's Committee on Nutrition. Previous articles on Diet and Nutrition can be found in the *Journal*, 1938, **38:** 277, 387, 491, 586; **39:** 76, 179, 280, 389, 483, 578; 1939, **40:** 77, 174, 282, 393.

The above table will convince you that the child will receive too little calcium unless it drinks four glasses of milk daily or takes its equivalent as cream, cheese and ice-cream. A pint of milk, four ounces of cream, an ounce of cheese, and a serving of a leafy vegetable will meet the demand. On the other hand, it would be impossible for the child to eat sufficient quantities of meat, eggs and white bread to obtain the desired amount of calcium. Our forbears were wiser than they knew when they cherished the cow, for she patiently and with never a complaint extracts the calcium from large quantities of grass and delivers it to us in so small a package that we imbibe it with ease and pleasure. The occasional child who is sensitized to milk need not be deprived of its quota of calcium since the physician can prescribe it as a medicine.

Even more difficult is the problem of assuring an adequate intake of the various vitamins, because our recently acquired opportunity for obtaining a highly varied diet throughout the year is due to the refinement and preservation of foods—processes tending to remove and destroy considerable amounts of the vitamins which were present in the foods before man had tampered with them. You must realize that recognition of the existence and the importance of the vitamins is very recently acquired knowledge. Eijkman (1897) produced an illness in fowls similar to beri-beri by confining them to a diet of polished rice. He attributed the illness to the lack of some factor that was present in the whole grain, but that explanation seemed too bizarre at a time when every one was thrilled by Pasteur's great discovery that bacteria caused disease. It required the demonstration of the great English chemist, Hopkins, that purification of foods caused definite illnesses, to force the recognition of this great fact. In 1906 he wrote: "No animal can live upon a mixture of pure protein, fat and carbohydrate, even when the necessary inorganic material is carefully supplied. The animal body is adjusted to live either upon plant tissues or other animals, and these contain countless substances other than proteins, fats and carbohydrates."

The vitamins may be thought of as catalysts or enzymes. That is, their presence in minute amounts promotes and accelerates chemical reactions. Thus, the chemical engineer produces fertilizer by exposing nitrogen and hydrogen to a mixture of finely divided iron and molybdenum. The presence of the minute metallic particles causes the two gases to unite with the rapid formation of ammonia. Nitrogen makes up four-fifths of the air, but in its ordinary gaseous state it is of no value to plants.

Similarly, the familiar process of digestion is wholly dependent upon enzymes. Almost none of the food that we eat is in a state that makes absorption possible. It must first be broken down into similar units; and this fragmentation results from the contact of the food with a great variety of substances whose sole function is to assure digestion. Some enzymes are made by the body itself, but many reactions take place within the organism because of the presence of still other enzymes that the body is unable to make from any of the materials within it. It must obtain these substances in their finished form from the outside as constituents of the food. These are the vitamins. We are now ready to see how these major dietary requirements can be satisfied, but first we must learn how much of each is needed by consulting the table which lists average needs.

TABLE III.

CHIEF DIETARY REQUIREMENTS

Calories	3,000
Protein	60 grams
Calcium	1.0 gram
Vitamins	
A	+++
B	+++
C	+++
D	+++

It must be realized that there is considerable variation in the requirement for calories. Older boys will often have to take 4,000 or even 5,000 calories to complete their growth at the normal rate. With advancing age less energy is expended, so that in the period of senility 2,000 calories may be sufficient. During the latter half of pregnancy as well as during the nursing period it is recommended that the mother should receive two grams of calcium daily.

TABLE IV.

AMERICAN BIG CITY DIET

Food	*Amount*	*Calories*	*Protein grams*	*Calcium grams*	*Vitamins*			
					A	B	C	D
Potatoes	1 pound	380	8	0.05	+	++	++	+
Flour, white	1 pound	1,600	50	0.10	0	0	0	0
Meat	½ pound	350	45	0	0	++	0	0
Sugar	¼ pound	450	0	0	0	0	0	0
Fat	⅛ pound	500	0	0	0	0	0	0
Totals		3,280	103	0.2	+	++	+	0
Requirements		3.000	60	1.0	+++	+++	+++	+++

The next table will show you in somewhat exaggerated form the type of diet that is so common in our big cities. It is woefully lacking in calcium and in the vitamins. Robust health is precluded by disregard for milk, fruit and green vegetables. Nevertheless, an adequate diet may easily be selected by anyone who has learned the rudiments of nutrition. The following combination of foods is suggested for those of very limited means.

It was pointed out earlier that iodine is one of the minerals that needs special consideration. This is especially interesting since only a minute amount of iodine is required. In fact, a small pinch of it, spread out over a whole year, is more than sufficient. But, unlike the other dietary requirements, an adequate intake cannot be obtained by eating liberal quantities of certain foods. For it is a fact that the iodine content of foods is dependent upon the locality in which

TABLE V.

SIMPLIFIED ADEQUATE DIET

Food	*Amount*	*Calories*	*Protein grams*	*Calcium grams*	*Vitamins*			
					A	B	C	D
Milk	1 quart	700	33	1.2	+++	++	0	+++
Cabbage or other green leaves, or fruit	1 pound	100	5	0.2	+++	+++	+++	+++
Bread, whole-wheat	1 pound	1,100	40	0.2	+	++	0	0
Potatoes	½ pound	200	5	0	0	++	++	0
Fats—butter substitutes, lard, Vegetable fats	¼ pound	1,100	0	0	0	0	0	0
Totals		3,200	83	1.6	+++	+++	+++	+++
Requirements		3.000	60	1.0	+++	+++	+++	+++

This diet is lacking in variety and interest, but nevertheless can be relied upon to supply all the elements necessary for normal nutrition. Meat has been omitted, to reduce the cost and the effort of preparation. Whole-wheat bread supplies the protein and vitamin B that would have been obtained from the meat. Butter has also been left out. It is not needed since the vitamins A and D contained in it are plentifully furnished by the milk and the green vegetables and fruit. The cheap fats listed furnish as many calories as equal weights of butter.

When cost and time required for preparations are not primary considerations a more interesting and satisfying day's menu can be prepared from the foods listed in the next table.

they are grown. In several large areas of the earth, of which the Central Plain of North America is one, the soil contains so little iodine that the local food supply is always deficient in iodine, and this condition is responsible for the high incidence of goitre in such regions. In Michigan the general use of iodized salt has proven to be strikingly successful in preventing goitre and even in curing it in the early stages. On the other hand, persons who live at or near the sea always receive an adequate amount of iodine without giving any thought to the matter.

The merits and demerits of common foods may be set down briefly as follows. A combination of milk, vegetables and fruits contains all the dietary essentials but calories. Without a radical

TABLE VI.

WHOLLY ADEQUATE DIET

Food	*Amount*	*Calories*	*Protein grams*	*Calcium grams*	*Vitamins*			
					A	B	C	D
Milk	1 pint	350	17	0.6	++	+	0	++
Cream	3 ounces	210	3	0.1	++	+	0	++
Eggs	2	225	20	0.1	+++	+	0	+++
Fruits and green leaves	1 pound	115	3	0.2	++	+++	+++	++
Flour, bread, cake, pie	⅓ pound	550	17	0	0	0	0	0
Meat or fish or poultry	½ pound	350	45	0	0	++	0	0
Potatoes	⅓ pound	150	3	0	0	++	++	0
Butter	¼ pound	800	0	0	+++	0	0	+++
Sugar	2 ounces	250	0	0	0	0	0	0
Totals		3,000	108	1.0	+++	+++	+++	+++
Requirements		3,000	60	1.0	+++	+++	+++	+++

change in our food habits it is impossible to construct a normal diet without them. Meat, poultry, fish and eggs are valuable for flavour and protein, but alone they are incapable of furnishing sufficient calcium and vitamins. White flour, refined cereals, and sugar are excellent sources of calories but have no other value. Whole-wheat flour is preferable to white flour because whole wheat contains a considerable amount of vitamin B. Fats are the best sources of calories and add flavour. None of them, with the exception of butter, has any other value.

Retrospect

TRANSITORY LUNG INFILTRATIONS ASSOCIATED WITH EOSINOPHILIA

BY C. S. BARKER

Montreal

The subject of transitory lung infiltrations associated with eosinophilia has received a great deal of attention in Europe, but apparently very little on this continent. A short review of the literature seems worth while.

In 1932 Löffler[1] described a number of cases in which *Succedansschatten,* as he called them, had been present. These fleeting shadows were of undetermined etiology. They appeared and disappeared within a few days; they often reappeared. The general health of the patient showed little change; at the most, some malaise, possibly a little fever, and rather transient cough and glairy sputum. Indeed the finding was often incidental to a routine x-ray examination of the chest. The sedimentation rate was normal or only slightly elevated. The differential blood count, however, was remarkable; the eosinophil cells showed an increase, often being 10 per cent and in one case as high as 66 per cent. This eosinophilia disappeared as the x-ray shadows cleared up. The similarity to tuberculous infiltrations was noted; indeed the persistance for longer than two weeks of these infiltrations tended to place them in this category. In many of the cases the tuberculin test was negative.

In 1936 Löffler[2] described another series of cases. Essentially the description was the same. Note was made of occasional cases where a slight pleuritic pain was complained of, and a slight rub heard. Other physical signs sometimes noted were changes in the breath sounds, fine râles, and occasionally slight impairment of the percussion note. He described the following types: (1) large infiltrations; (2) small round, simulating early infiltrations of tuberculosis; (3) multiple types; (5) sharply defined by the lobar borders; (5) those simulating secondary tuberculous infiltrations.

The seasonal distribution of the cases is of some interest. Most occurred in July and August. This seasonal incidence has suggested a pollen etiology. There has been considerable evidence that this is so in the cases occurring at Shanghai, according to Engel. In the European cases, however, this evidence has been for the most part lacking. Meyer[3] does adduce some evidence that this may be a factor in Europe. He describes the sudden development in a patient of 24 of snuffles, conjunctivitis, and swelling of the face, followed in four days by cough, later productive of yellowish sputum. The x-ray showed a shadow in the right lung. The patient was tested with *Convallaria majalis* pollen, and showed a positive result. On protection from this offender, his symptoms rapidly improved, and the x-ray of his chest was negative within a week. At the time of his worst troubles his white blood count was 7,400, and 26 per cent were eosinophils. He had a similar attack the previous year at the same time.

Two-thirds of the cases have been in men.

Ascaris lumbricoides has been held guilty by some, ova having been found in the stools of some cases. It is thought that the passage of the larvæ through the lung has resulted in these transient infiltrations. But if this is the case, the consensus is that it is the cause in only a few cases.

Löffler mentions the possible connection with bronchial asthma, atelectasis, and lung trauma. He, however, enlarges most on the possible tuberculous etiology. Out of 37 cases negative tuberculin tests were found in 13. Of the positives 12 were weak, 10 were moderate, and 2 were marked. His general conclusion is that this is an allergic state which may be set in motion by a variety of allergens.

Breton,[4] writing of the syndrome, says that it occurs in 5 to 8 per cent of asthmatics. He reports a case in a child of 9 years during an asthmatic crisis. He states that the differentiation between tuberculosis and the syndrome is difficult. In fact he, like others, thinks that it is due to tuberculosis. He too mentions the possibility of localized areas of atelectasis and emphysema being etiological factors. Meyer mentions observing 8 cases of this type. In each case he felt that tuberculosis was the probable etiological factor; in none, however, did proved tuberculosis develop. Soderling, writing about asthmatic children, considers that areas of atelectasis occur frequently in severe attacks and give rise to parenchymal shadows which clear up quickly.

An interesting case is described by J. Steiger.[5] A marked infiltration had cleared by the 13th day of observation. He, too, mentions that such shadows have been described in asthma. Cardis, Gilliard, and Spriet[6] mention

a case known to have had tubercle bacilli in the sputum in 1934. The sputum was negative subsequently. In 1936 a shadow was reported in the x-ray, without accompanying clinical symptoms. It disappeared within a week. It was accompanied by an eosinophilia of 7 per cent, falling to 2.5 per cent two months later.

Douady and Cohen[7] describe a case in which hæmoptysis occurred along with the infiltration. An eosinophilia was present. The infiltration cleared up rapidly and tuberculosis was never proved.

A considerable literature has thus developed in connection with these transitory lung infiltrations associated with eosinophilia. The infiltrations in this group are apparently benign, although they constantly carry with them the suggestion of tuberculosis. Their fleeting character is likely to be missed unless x-ray examination is repeated at short intervals. It would seem of great importance in determining the prognosis of a recent lung infiltration suspected to be tuberculous, to keep the possibility of this syndrome in mind.

REFERENCES

1. LÖFFLER, W.: Zur Differential-Diagnose der Lungeninfiltrierungen *et seq.*, *Beitr. z. Klin. d. Tuberk.*, 1932, **79**: 368.
2. *Idem*: Die flüchtigen Lungeninfiltrate mit Eosinophilie, *Schweiz. med. Wchnschr.*, 1936, **66**: 1069.
3. MEYER, H. E.: Zur Kenntnis flüchtiger, mit Eosinophilie im Blut einhergehender Lungeninfiltrate, *Med. Welt.*, 1937, **11**: 1808.
4. BRETON, A.: A propos de la radiologie de l'asthme: le syndrome de Löffler, *Paris Med.*, 1938, **1**: 538.
5. STEIGER, J.: Flüchtige Lungeninfiltrierungen mit Eosinophilie, *Deutsches Tuberk. Bl.*, 1937, **11**: 154.
6. CARDIS, F., GILLIARD, A. AND SPRIET, H.; A propos du syndrome de Löffler, *Rev. de la Tuber.*, 1937, **3**: 830.
7. DOUADY, D. AND COHEN, R.: Syndrome de Löffler avec hémoptysies et accidents rénaux fugaces, *Rev. de la Tuber.*, 1938, **4**: 88.

Men and Books

JOHN McCRAE'S AUTOPSY BOOK

BY H. E. MACDERMOT

Montreal

Who more than the pathologist is tempted to soliloquize on death? And when he happens also to have in him the elements of a poet, who rather than he should yield to the temptation? In John McCrae there was just that combination of training with illumination of mind. The memorial window to him in the McGill Medical Building bears the legend "Pathologist, poet, physician, soldier, a man among men". Perhaps he is not often thought of as a pathologist, but early in his career he laid, as director of the pathological department at the Montreal General Hospital, the foundations of his brilliant clinical work. It was then that he made an entry in one of the volumes of autopsy reports which is the subject of this comment.

At that time all the hospital autopsies were recorded by hand in large books. McCrae's writing fills many of these pages, firm, clear, and careful, illustrated sometimes by sketches, and admirable always in its thoroughness and exactitude. His scrupulous attention to detail is a tradition of his department which has been well preserved by his successors, but the permanent record is now in typewriting.

The volume for the year 1901 bears on one of its front pages the following inscription in McCrae's hand:

Jan. 3/'02

Here begynneth ye Booke of ye Deade, wherin is fayrely set foorth ye last state of four Hundred and seventeene persones, that have departed this lyfe; wherein be tabled diverse straunge and fearsome condicions that have ledde to ye same final ende: God have them of his grace.

And then he quotes these lines:

"Our lyfe is but a Winter's Day.
Some only breakfast and away.
Others to dinner stay, and are fulle fedde.
The oldest man but suppes, and goes to bedde.
Large is his dette, that lingers out the day.
He that goes soonest, hath the least to pay! !"

The source of this verse is not definitely known, except that it was a form of epitaph which appears in more than one churchyard. It has been attributed to Joseph Henshaw, Bishop of Peterborough, in the 17th century, but the sentiments have been expressed in various ways, and it is difficult to be sure that he is solely responsible. At any rate, the form in which it is given in his "Horæ Succisivæ" (1631) differs considerably from what McCrae has written. Here are the lines as the Bishop is supposed to have written them:* the spelling has been modernized.

Man's life is like unto a winter's day—
Some break their fast and so depart away;
Others stay dinner, then depart full fed:
The longest age but sups and goes to bed.
O reader, then behold and see!
As we are now, so you must be.

The differences are obvious throughout, but the last two lines have been more than changed in McCrae's version: they have undergone a transmutation from the commonplace to poetry. Whether or not McCrae himself was responsible for this we do not know, but he was quite capable of doing it. Before many more years he was to take up the theme again, this time leaving us in no doubt either as to the authorship or as to the maturity of his poetic gift. The one was a soliloquy alone, tinged with the whimsical: the other is the controlled music born of grief at untimely death.

We are the Dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders Fields.

* As given in Bartlett's "Familiar Quotations", 9th ed., London, 1907, p. 263. Dr. W. W. Francis is to be credited with tracing the verse.

Association Notes

THE SEVENTIETH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION, WITH THE ASSISTANCE OF THE QUEBEC DIVISION OF THE ASSOCIATION, TO BE HELD IN MONTREAL, JUNE 19, 20, 21, 22, 23, 1939

Convention Headquarters, Windsor Hotel

The Canadian Medical Association

President, K. A. MACKENZIE, Halifax;
President-elect, F. S. PATCH, Montreal;
General Secretary, T. C. ROUTLEY, Toronto.

The Quebec Division

President, W. W. LYNCH, Sherbrooke, Que.;
Vice-president, D. S. LEWIS, Montreal;
Secretary, A. W. YOUNG, Montreal.

Message from the President-Elect

On behalf of the members of the Quebec Division of the Canadian Medical Association it is my privilege to extend a cordial invitation to all members of the Canadian Medical Association to attend the Seventieth Annual Meeting in Montreal during the week of June 19th next.

Ten years have elapsed since the Association last met in Montreal. Since that time there has been a revival of our provincial medical activities, in the newly organized Quebec Division, which has been functioning for over a year. Its extraordinarily rapid growth is a source of great satisfaction to its members, who look forward with a keen and pleasurable anticipation to this occasion on which it will have the pleasure of acting as host to the Association.

The Central Program Committee, under the efficient chairmanship of Dr. Duncan Graham, Toronto, has prepared an excellent program for the scientific meetings. In addition to three General Sessions there will be one or more Sectional Meetings in each of thirteen specialties. These various meetings offer a wide range of subjects, from which members may make a selection.

A new feature is being introduced this year, which it is hoped will meet with the approval of the Association's membership. Round-table Conferences on a variety of subjects are to be held at hours which will not conflict with General Sessions and Sectional Meetings. The subjects selected for the Conferences will be practical, and there will be ample opportunity for question and answer and a free discussion, in so far as the allotted time will permit. If the experiment is successful, doubtless the Conferences will become a permanent fixture at our Association meetings.

The Convention may count itself fortunate in having so distinguished a visitor from the British Isles as Professor E. P. Cathcart, Professor of Physiology, University of Glasgow, Scotland. Professor Cathcart is coming to Canada under the auspices of the Committee on Nutrition of the Association. He has been kind enough to promise an address at one of the General Sessions. He is also to deliver a public address on a subject dealing with nutrition on Monday evening, June 19th. At this meeting, members of the General Council and their wives will be welcome.

The British Medical Association is sending a representative, Prof. A. B. Appleton, Professor of Anatomy, of St. Thomas' Hospital, London. Dr. Appleton is to deliver a paper at one of the general sessions. This evidence of the continued interest of the British Medical Association in our Association will, I feel sure, be gratefully received by our membership.

Another welcome transatlantic visitor will be Sir Arthur MacNalty, Chief Medical Officer, Ministry of Health, London. Sir Arthur is to address the General Council at one of its luncheon meetings.

The Lister Oration is to be delivered by Dr. Allen O. Whipple, Professor of Surgery, Columbia University, New York City. Professor Whipple is a worthy representative of American surgery, an outstanding surgeon and teacher, and the members may look forward to an instructive and inspiring presentation.

The scientific and commercial exhibits promise to be of an attractive character. Already the accommodation available for both exhibits has been exhausted, and it has been necessary to refuse any further applications.

In the matter of entertainment, our local committees are making every effort to provide for this essential part of a Canadian Medical Association Convention. For the men pleasant entertainment is promised, to divert them after the strenuous activities of scientific and business meetings. At the daily luncheons short addresses are to be delivered by speakers of prominence in our community. For the ladies Montreal offers many attractions in the way of sightseeing, shopping, golfing, etc. Apart from this, many social activities are planned to make

their visit to the metropolis as pleasant as possible. For the young people, particularly those in the teen ages, many interesting and novel features of entertainment are being provided.

Montreal is keenly anxious that this convention shall be a success, and the Quebec Division is doing everything in its power to make it so. We hope for a large attendance. Make your reservations early. Those who come are assured of a warm welcome. Montreal latch strings are out on this occasion.

F. S. PATCH, M.D.

PROVISIONAL PROGRAM

Monday, June 19th

9.00 a.m.—Registration.
9.30 a.m.—Meeting of General Council.
12.30 p.m.—Luncheon.
2.00 p.m.—Meeting of General Council.
6.00 p.m.—Meeting of Nominating Committee.
8.30 p.m.—Ritz-Carlton Hotel—Public Address, under the auspices of the Committee on Nutrition of the Canadian Medical Association—E. P. Cathcart, Professor of Physiology, University of Glasgow, Glasgow. Subject, "Food and Nutrition."

Tuesday, June 20th

9.30 a.m.—Meeting of General Council.
12.30 p.m.—Luncheon. Address by Sir Arthur MacNalty, London.
2.00 p.m.—Meeting of General Council.
2.15 p.m.—Official Opening of Exhibit Hall.
8.30 p.m.—Dinner to General Council.
Hosts: Quebec Division, Canadian Medical Association, together with the Montreal Medico-Chirurgical Society and La Société Médicale de Montréal.

Wednesday, June 21st

8.00 a.m.—Registration.
8.30 a.m.—Round-table Conferences and Instructional Courses.

Wednesday, June 21st—*Continued*

9.30 a.m.—General Session.
1.00 p.m.—Luncheon.
2.30 p.m.—Sectional Meetings.
8.30 p.m.—Annual General Meeting.
10.00 p.m.—Reception and Dance.

Thursday, June 22nd

8.00 a.m.—Registration.
8.30 a.m.—Round-table Conferences and Instructional Courses.
9.30 a.m.—Sectional Meetings.
1.00 p.m.—Luncheon.
2.30 p.m.—Meeting of incoming Executive Committee.
2.30 p.m.—General Session.
5.30 p.m.—Meeting of Canadian Medical Protective Association.
7.30 p.m.—Alumni and Private Dinners.
10.00 p.m.—Dance, Normandie Roof.

Friday, June 23rd

8.00 a.m.—Registration.
8.30 a.m.—Round-table Conferences and Instructional Courses.
9.30 a.m.—General Session.
1.00 p.m.—Golf Tournament.
Royal Montreal Golf Club, Dixie, Que.
7.30 p.m.—Golf Dinner, Royal Montreal Golf Club.

SCIENTIFIC PROGRAM

GENERAL SESSIONS

Wednesday, June 21st

9.30 a.m.—

Pulmonary emphysema—Dr. J. D. Adamson, Winnipeg.

A review of the present status of hypertension—Dr. J. C. Meakins, Montreal.

Retinal changes in arterial hypertension—Dr. A. J. Bedell, Albany, N.Y.

President's Valedictory Address—Dr. K. A. MacKenzie, Halifax.

Nutrition—Professor E. P. Cathcart, Glasgow, Scotland.

Thursday, June 22nd

2.30 p.m.—

Gall-bladder surgery—Dr. F. B. Gurd, Montreal.

Treatment of dysmenorrhœa—Dr. Norman Miller, Ann Arbor, Mich.

The use of the Smith-Peterson pin in fractures of the neck of the femur—Dr. W. E. Gallie, Toronto.

Epilepsy and the cerebral lesions of birth and infancy—Dr. Wilder Penfield, Montreal.

Insulin therapy and hypoglycæmia for cases of schizophrenia—Dr. E. C. Menzies, Saint John.

Syphilis as a Canadian problem—Dr. F. E. Cormia, Montreal.

Friday, June 23rd

9.30 a.m.—

Review of specific therapy in pneumonia—Dr. James Ross, Montreal.

Physical exercises—Professor A. B. Appleton, University of London, at St. Thomas's Hospital, London, England.

Infant feeding during the past three decades—Dr. H. B. Cushing, Montreal.

The Lister Oration

A consideration of recent advances in surgery in the light of Lord Lister's studies—Dr. Allen O. Whipple, New York.

The Osler Hour

Typhoid fever—Dr. J. C. Meakins, Montreal.

Acute endocarditis—Dr. A. H. Gordon, Montreal.

Aortic syphilis—Dr. John Hepburn, Toronto.

Polycythæmia rubra vera—Dr. Duncan Graham, Toronto.

ROUND-TABLE CONFERENCES AND INSTRUCTIONAL COURSES

Anæsthesia

THURSDAY, JUNE 22ND

8.30 a.m.—

Subject: The choice of anæsthetic.
Dr. Wesley Bourne, Montreal (*Chairman*).

Dental anæsthesia—Dr. Moise M. Clermont, Montreal.

Plastic surgery of head and neck—Dr. H. R. Hargrave, Toronto.

Cæsarean section—Dr. Kenneth M. Heard, Toronto.

Diseases of the liver—Dr. P. E. O'Shaughnessy, Montreal.

Heart disease—Dr. H. J. Shields, Toronto.

Kidney operations—Dr. E. H. Watts, Edmonton.

Brain surgery—Dr. F. A. H. Wilkinson, Montreal.

Diabetes—Dr. Don A. Warren, Hamilton.

Suprapubic prostatectomy—Dr. J. A. Blezard, London.

Transurethral prostatectomy—Dr. K. E. Hollis, Toronto.

Dermatology

THURSDAY, JUNE 22ND

11.00 a.m.—

Subject: The treatment of eczematous reactions.
Dr. J. F. Burgess, Montreal (*Chairman*);
Dr. B. D. Usher, Montreal;
Dr. D. S. Mitchell, Montreal.

Medicine

WEDNESDAY, JUNE 21ST

8.30 a.m.—

Anæmia—Dr. Joseph Kaufmann, Montreal.

THURSDAY, JUNE 22ND

8.30 a.m.—

Diuretics—Dr. D. Sclater Lewis, Montreal.

FRIDAY, JUNE 23RD

8.30 a.m.—

Pneumonia—Dr. A. H. Gordon, Montreal.

Military Medicine

THURSDAY, JUNE 22ND

11.30 a.m.—

The training of a medical officer—Major James A. Linton, Ottawa; Lieutenant-Colonel Gordon Kenning, Victoria.

Obstetrics and Gynæcology

WEDNESDAY, JUNE 21ST

8.30 a.m.—

Subject: Puerperal infection.
Dr. James R. Goodall, Montreal (*Chairman*).

The relationship of sepsis to the general maternal mortality in Canada—Dr. Ernest Couture, Ottawa.

The importance of a normal labour versus operative delivery in the prevention of infection—Dr. H. C. Burgess, Montreal.

The treatment of infection—Dr. L. T. Armstrong, Toronto.

THURSDAY, JUNE 22ND

8.30 a.m.—

Subject: Toxæmia of pregnancy.
Dr. William A. Scott, Toronto, (*Chairman*).

Important clinical features of toxæmia—Dr. H. B. VanWyck, Toronto.

The diagnosis and prognosis of toxæmia—Dr. Ross Mitchell, Winnipeg.

The treatment of toxæmia—Dr. R. B. Meiklejohn, Toronto.

FRIDAY, JUNE 23RD

8.30 a.m.—

Subject: Hæmorrhage at the menopause.
Dr. Léon Gérin-Lajoie, Montreal (*Chairman*).

The influence of the ovarian hormones on hæmorrhage at the menopause—Dr. Melville Watson, Toronto.

Diagnosis of hæmorrhage at the menopause—Dr. J. Stewart Henry, Montreal.

Treatment of hæmorrhage at the menopause—Dr. J. E. Gendreau, Montreal, and Dr. W. A. G. Bauld, Montreal.

Ophthalmology

THURSDAY, JUNE 22ND

8.30 a.m.—

Subject: Glaucoma, diagnosis and treatment.
Dr. S. Hanford McKee, Montreal (*Chairman*).

Biochemical changes in glaucoma—Dr. T. H. Hodgson, Toronto.

Diagnosis of glaucoma—Dr. Stuart Ramsey, Montreal.

Treatment of glaucoma—Dr. J. A. MacMillan, Montreal.

Otolaryngology

WEDNESDAY, JUNE 21ST

8.30 a.m.—

Pathology of the ear—Dr. Gregor McGregor, Toronto.

The management of acute infections of the ear—Dr. J. K. M. Dickie, Ottawa.

Special technique in mastoid and facial nerve surgery—Dr. J. A. Sullivan, Toronto.

The diagnosis and present treatment of sinus disease—Dr. Perry G. Goldsmith, Toronto.

THURSDAY, JUNE 22ND

8.30 a.m.—

Pathology of the nose and throat—Dr. Gregor McGregor, Toronto.

The diagnosis and surgical treatment of suppurative petrositis—Dr. D. E. S. Wishart, Toronto.

Lesions of the mouth of interest to the physician—Dr. John W. Gerrie, Montreal.

Atrophic rhinitis and ozæna—Dr. R. P. Wright, Montreal.

FRIDAY, JUNE 23RD

8.30 a.m.—

Headaches and neuralgia of the face—Dr. Francis L. McNaughton, Montreal.

The conservative and radical treatment of chronic otorrhœa—Dr. J. T. Rogers, Montreal.

Allergy in relation to the ear, nose and throat—Dr. A. T. Henderson, Montreal.

X-ray examination of the mastoids and sinuses—Dr. A. E. Childe, Montreal.

Pædiatrics

WEDNESDAY, JUNE 21ST

8.30 a.m.—

Subject: X-ray lesions of the bones in infancy.
Dr. L. M. Lindsay, Montreal (*Chairman*);
Dr. A. E. Childe, Montreal;
Dr. Howard S. Mitchell, Montreal.

THURSDAY, JUNE 22ND

8.30 a.m.—

Subject: Convulsions in infancy and childhood.
Dr. S. Graham Ross, Montreal (*Chairman*);
Dr. A. W. Young, Montreal.

FRIDAY, JUNE 23RD

8.30 a.m.—

Subject: Tuberculosis in Childhood.
Dr. H. P. Wright, Montreal (*Chairman*);
Dr. P. N. MacDermot, Montreal.

Radiology

WEDNESDAY, JUNE 21ST

8.30 a.m.—

Subject: Spot-film radiography.
Dr. W. L. Ritchie, Montreal (*Chairman*);
Dr. A. C. Singleton, Toronto;
Dr. A. M. McNabb, Ottawa.

THURSDAY, JUNE 22ND

8.30 a.m.—

Subject: The radiological treatment of cancer.
Dr. J. E. Gendreau, Montreal (*Chairman*);
Dr. W. L. Ritchie, Montreal;
Dr. Carleton B. Peirce, Montreal;
Dr. Origène Dufresne, Montreal.

Surgery

WEDNESDAY, JUNE 21ST

8.30 a.m.—

Subject: Oblique and direct inguinal hernia; choice of the radical operation.
Dr. Geo. E. Wilson, Toronto (*Chairman*);
Dr. C. B. Keenan, Montreal;
Dr. R. K. Magee, Peterborough.

THURSDAY, JUNE 22ND

8.30 a.m.—

Subject: Surgical treatment of acute appendicitis.
Dr. E. W. Archibald, Montreal (*Chairman*);
Dr. Achille Paquet, Quebec;
Dr. Roscoe R. Graham, Toronto.

Urology

WEDNESDAY, JUNE 21ST

4.00 p.m.—

Subject: Prostatectomy.
Dr. D. W. MacKenzie, Montreal (*Chairman*);
Dr. H. D. Morse, Winnipeg.

THURSDAY, JUNE 22ND

11.00 a.m.—

Subject: Urinary antiseptics with particular reference to mandelic acid and sulphanilamide therapy.
Dr. D. R. Mitchell, Toronto (*Chairman*);
Dr. R. E. Powell, Montreal.

SECTIONAL MEETINGS

Section of Anæsthesia

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Selection of anæsthesia for upper abdominal operations—Dr. C. C. Stewart, Montreal.

Studies with a newer anæsthetic—Dr. W. Easson Brown, Toronto.

Anæsthesia in orthopædic and thoracic surgery—Dr. Georges Cousineau, Montreal.

Cyclopropane as a complete anæsthetic agent—Drs. B. C. Leech, Regina, and Harold R. Griffith, Montreal.

Nupercaine spinal anæsthesia in abdominal surgery—Dr. A. R. Wilkins, Toronto.

Section of Dermatology

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Treatment of plantar warts—Dr. Norman Wrong, Toronto.

The place of allergy in the diagnosis of skin conditions—Dr. D. E. H. Cleveland, Vancouver.

Some fundamental principles in the treatment of skin disorders—Dr. Geo. B. Sexton, London.

Peri-ocular dermatitis—Dr. Lemuel P. Ereaux, Montreal.

Atopic dermatitis in infants (infantile eczema), children, and young adults—Dr. Geo. S. Williamson, Ottawa.

THURSDAY, JUNE 22ND

9.30 a.m.—

Syphilis of the nervous system—Dr. A. Marin, Montreal.

The prevention of congenital syphilis—Dr. E. J. Trow, Toronto.

The chemotherapy of acquired syphilis—Dr. Harold Orr, Edmonton.

Section of Historical Medicine

WEDNESDAY, JUNE 21ST

2.30 p.m.—

An exposure of Doctor (?) de Sales Laterrière, (1747-1815)—Dr. Léo Pariseau, Montreal.

The astonishing career of John Palmer Litchfield, first professor of forensic medicine at the University of Queen's College, Kingston—Dr. Thos. Gibson, Kingston.

Dr. Cheedle in Western Canada, 1862-1863—Dr. Ross Mitchell, Winnipeg.

Alberta Medicine in the eighties—Dr. H. C. Jamieson, Edmonton.

Osler's pathological collection and his literary output (illustrated)—Dr. Maude Abbott, Montreal.

THURSDAY, JUNE 22ND

9.30 a.m.—

Oliver St. John Gogarty; the Celt as physician—Dr. E. P. Scarlett, Calgary.

Hippocrates' Hawley Table—Dr. J. H. Couch, Toronto.

Our debt to Hippocrates (lantern slides)—Dr. Eugène St. Jacques, Montreal.

An hour in Salerno—Dr. J. H. Elliott, Toronto.

Antique medical caricatures—Dr. T. G. H. Drake, Toronto.

Section of Medicine

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Healed dissecting aneurysm of the aorta—Dr. Edward Bartram, London.

Angina pectoris; a case study—Dr. E. P. Scarlett, Calgary.

Goitre et hypertension arterielle.
Considération à propos de 700 cas de goitre—Dr. J. B. Jobin, Quebec.

The hypertensive heart—Dr. A. B. Walter, Saint John.

Boeck's Disease (sarcoid); its clinical groups and diagnosis—Dr. John H. Palmer, Montreal.

The physician's interest in gall-bladder disease—Dr. A. H. Gordon, Montreal.

THURSDAY, JUNE 22ND

9.30 a.m.

Treatment of hæmorrhagic states—Dr. E. S. Mills, Montreal.

The diagnosis and treatment of refractory anæmias—Dr. Lennox Bell, Winnipeg.

Bronchoscopy in sanatoria; its use as an aid in diagnosis and treatment—Dr. J. H. Holbrook, Hamilton.

Pollen Disease in Western Canada—Dr. Charles H. A. Walton, Winnipeg.

L'Obésité. Quelques conceptions étiologiques et modalités thérapeutiques—Dr. J. R. Pepin, Montreal.

Dangers of protamin zinc insulin—Dr. I. M. Rabinowitch, Montreal.

Section of Military Medicine

THURSDAY, JUNE 22ND

9.30 a.m.—

Investigations on the "blacking out" of Pilots, R.A.F.—Major Hugh Cameron, Toronto.

Mechanization in Relation to Medical Services—Lt.-Col. R. M. Gorssline, D.S.O., Montreal.

Section of Obstetrics and Gynæcology

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Breech presentation: a method of treatment with discussion of results—Dr. N. W. Philpott, Montreal.

Treatment of placenta prævia—Dr. W. A. Scott, Toronto.

The treatment of vertex occipito-posterior positions—Dr. John Mann, Toronto.

The treatment of labour in the elderly primiparous woman—Dr. James Duncan, Montreal.

Induction of labour—Dr. W. P. Tew, London.

The management of delayed labour—Dr. G. C. Melhado, Montreal.

THURSDAY, JUNE 22ND

9.30 a.m.—

The value of a well-organized prenatal clinic—Dr. J. D. McQueen, Winnipeg.

Skin affections of the new-born—Dr. Alan Ross, Montreal.

The significance of the endocrine assays in threatened and habitual abortion—Dr. John S. L. Browne, Montreal.

The clinical significance of vulvar lesions—Dr. P. J. Kearns, Montreal.

The diagnosis and treatment of endometriosis—Dr. Geo. Hooper, Ottawa.

The clinical significance of sterility—Dr. A. D. Campbell, Montreal.

Section of Ophthalmology

WEDNESDAY, JUNE 21ST

2.30 p.m.

Changes in the fundus oculi following splanchnectomy in malignant hypertension—Drs. F. T. Tooke, Montreal and J. V. V. Nicholls, Montreal.

Eye-signs in intracranial disease—Dr. R. J. P. McCulloch, Toronto.

Recent advances in the care of the insensitive cornea—Dr. Alexander E. MacDonald, Toronto.

Keratitis bullosa and keratitis vesicular—Dr. François Badeaux, Montreal.

A pathological study of perforating corneal wounds—Dr. K. B. Johnston, Montreal.

THURSDAY, JUNE 22ND

9.30 a.m.

Some observations on the surgical treatment of concomitant strabismus — Dr. Howard Folger, Kingston.

Moving pictures of muscle operations—Dr. J. P. Gilhooly, Ottawa.

Thursday, June 22nd—*Continued*

Hemianopsia with spared macula—Dr. H. M. Macrae, Toronto.

The virus of inclusion conjunctivitis—Dr. Hanford McKee, Montreal.

Section of Otolaryngology

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Focal infection in the nose and throat—Dr. Howard McCart, Toronto.

The testing of hearing aids—Dr. Godfrey Burr, Montreal.

Routine hearing tests—Dr. D. E. S. Wishart, Toronto.

How to be wrong; the x-ray, a quick and easy method—Dr. H. W. Schwartz, Halifax.

THURSDAY, JUNE 22ND

9.30 a.m.—

Foreign bodies in the air and food passages—Dr. David H. Ballon, Montreal.

The significance of lung collapses to the otolaryngologist—Dr. S. Laird Alexander, Toronto.

Diagnosis and treatment of malignant tumours of the pharynx—Dr. F. A. Cays, Kingston.

Tumours and cysts of the mouth and jaw and their treatment—Dr. E. F. Risdon, Toronto.

Treatment of nasal sinus infection by ultra-short-wave diathermy—Dr. W. P. E. Paterson, Ottawa.

Section of Pædiatrics

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Observations on the results of self-selection of diets by infants—Dr. Clara Davis, Winnetka, Ill.

Etiology and treatment of nephritis in childhood—Dr. Alan Ross, Montreal.

The use of the sedimentation rate in pædiatric practice—Dr. Jessie Boyd Scriver, Montreal.

The treatment of juvenile diabetes—Dr. Gladys Boyd, Toronto.

Vitamin D intoxication in infancy—Drs. Graham Ross, Montreal, and W. E. Williams, Montreal.

Some aspects of intra-cranial birth injuries—Dr. Reginald Kinsman, Vancouver.

THURSDAY, JUNE 22ND

9.30 a.m.—

Immunization in whooping-cough—Dr. Nelles Silverthorne, Toronto.

Newer drugs in the treatment of epilepsy—Drs. Haddow M. Keith, Montreal and J. N. Petersen, Montreal.

Thursday, June 22nd—*Continued*

The significance of melæna—Dr. Harold Little, London.

Recurrent abdominal pain in childhood—Dr. R. R. Fitzgerald, Montreal.

Some aspects of the neo-natal death problem—Dr. King Rowan-Legge, Ottawa.

Histopathology of vitamin A deficiency (lantern slides)—Dr. Bruce Chown, Winnipeg.

Section of Radiology

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Hypertrophy of the pyloric muscle in the adult—Dr. E. M. Crawford, Pointe Claire, Que.

Lymphosarcoma of the stomach—Dr. E. C. Brooks, Montreal.

Syphilis of the stomach—Dr. W. W. Bryan, Montreal.

Cancer of the stomach—Drs. A. C. Singleton, Toronto and Jos. Sommers, Toronto.

Seriescopy—Dr. Jules Gosselin, Quebec.

THURSDAY, JUNE 22ND

9.30 a.m.—

Loeffler's Syndrome—Dr. J. W. McKay, Montreal.

The value of hysterosalpingography in gynæcological diagnosis—Drs. J. E. Gendreau, Montreal and O. Dufresne, Montreal.

Bronchogenic carcinoma—Dr. Carleton B. Peirce, Montreal.

Epithelioma of the limbus; biopsy; radium treatment; result after five years—Dr. E. P. Grenier, Montreal.

The findings in an x-ray film of the chest of an electric-arc welder—Dr. W. A. Jones, Kingston and Mr. G. Hayunga Ph.G., Kingston.

Section of Rheumatic Diseases

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Presidential address.

Rheumatic fever in childhood—Dr. R. R. Struthers, Montreal.

Some observations on vaccine treatment of arthritis—Dr. W. S. Barnhart, Ottawa.

Orthopædic treatment of arthritis—Dr. J. A. Nutter, Montreal.

Some causes of heart failure in chronic rheumatic heart disease—Dr. Neil Feeney, Montreal.

Section of Surgery

WEDNESDAY, JUNE 21ST

2.30 p.m.—

End-results of chronic osteomyelitis after ten years (review of cases)—Dr. Edmond Dubé, Montreal.

Wednesday, June 21st—*Continued*

A new surgical approach to the knee joint—Dr. V. O. Mader, Halifax.

Ambulatory treatment of fractures—Dr. Alexander Gibson, Winnipeg.

Acute intestinal obstruction—Dr. A. J. Grace, London.

Burns: treatment based on pathological physiology—Dr. R. A. Johnston, London.

The treatment of contracture due to burns—Dr. A. W. Farmer, Toronto.

The pathology and treatment of ischio-rectal abscess and fistula in ano—Dr. J. T. Danis, Toronto.

THURSDAY, JUNE 22ND

9.30 a.m.—

Extra-hepatic biliary growths, including malignant neoplasms—Dr. C. K. P. Henry, Montreal.

Bile-salt therapy in common duct drainage—Dr. A. L. Wilkie, Montreal.

The reasons for sub-total resection in cases of gastric and duodenal ulcer—Dr. Gavin Miller, Montreal.

Intractable gastric ulcer with final malignant change associated with benign tumour of the brain—Dr. P. H. T. Thorlakson, Winnipeg.

Spinal-cord complications in broken backs—Dr. E. H. Botterell, Toronto.

A contribution to the study of the surgical treatment of angina pectoris (illustrated by film)—Dr. Mercier Fauteux, Montreal.

Series of perforated peptic ulcers—Drs. Albert Ross, Montreal and Charles Letourneau, Montreal.

Section of Urology

WEDNESDAY, JUNE 21ST

2.30 p.m.—

Metastases in malignancy of the genito-urinary organs—Dr. Max Ratner, Montreal.

Present status of tumours of the bladder—Dr. M. I. Seng, Montreal.

The treatment of infiltrating tumours of the bladder, with special reference to cystectomy—Drs. Robin Pearse, Toronto and R. A. McComb, Toronto.

Unilateral multilocular cystic kidney with report of a case in a young child—Dr. W. A. Dakin, Regina.

Some observations and results of conservative renal surgery—Dr. N. E. Berry, Kingston.

4.00 p.m.—Round-table Conference, see p. 499.

THURSDAY, JUNE 22ND

9.30 a.m.—

The relative merits of intravenous and retrograde urograms—Drs. Gordon S. Foulds, Toronto and E. H. Shannon, Toronto.

Thursday, June 22nd—*Continued*

Surgical treatment of the traumatic strictures of the urethra—Dr. Oscar Mercier, Montreal.

Urological conditions in children—Dr. J. Victor Berry, Ottawa.

Renal tuberculosis—Drs. H. D. Morse, Winnipeg, and D. L. Scott, Winnipeg.

Bilateral renal calculi—Dr. Grant Reid, Montreal.

11.00 a.m.—Round-table Conference, see p. 499.

SCIENTIFIC EXHIBITS

Pictorial case records in a group of epileptic cases—Dr. J. N. Petersen, Montreal Neurological Institute.

Carcinoma of the stomach—Drs. A. C. Singleton and J. Sommers, Department of Radiology, Toronto General Hospital.

Facial reconstructive surgery—Dr. Fulton Risdon, Toronto.

Uretero-sigmoid anastomosis and cystectomy—Drs. Robin Pearse, and R. A. McComb, Toronto General Hospital.

Pathological lesions of the urinary tract—Dr. Oscar Mercier, Hotel-Dieu Hospital, Montreal.

Surgical conditions of the thorax—Chest Service, Royal Victoria Hospital, Montreal.

Associated medical services, incorporated—Toronto.

Renal tumours—Dr. Emerson Smith, Royal Victoria Hospital, Montreal.

Recent advances in the study of varicose veins and ulcers—Dr. Josephus C. Luke, Royal Victoria Hospital, Montreal.

Fractures about the ankle—Drs. H. Dolan and H. F. Moseley, Royal Victoria Hospital, Montreal.

Kodachrome transparencies of gastro-intestinal conditions—Dr. Gavin Miller, Royal Victoria Hospital, Montreal.

Synergism and cancer—Dr. Cameron Gruner, Archibald Cancer Research Fund, McGill University, Montreal.

Le B.C.G. dans le Québec 1926-1939 — Drs. Armand Frappier & L. A. Baudouin, Institut de Microbiologie et d'Hygiène, Université de Montreal, Montreal.

Diabetes mellitus—Staff of Clinic for Diabetes, The Montreal General Hospital, Montreal.

Ovarian tumours—Dr. P. J. Kearns, Women's Pavilion, Royal Victoria Hospital, Montreal.

Pneumococcus pneumonia—Drs. Montgomery and Richardson, The Montreal General Hospital, Montreal.

Skin diseases: moulages—Dr. Albéric Marin, Notre Dame Hospital, Montreal, P.Q.

The interrelation of systemic hæmatopoietic processes—Dr. Theo. R. Waugh, Pathological Institute, McGill University, Montreal.

The parasites of man in Canada—Dr. Thomas W. M. Cameron, Institute of Parasitology, McGill University, Macdonald College, P.Q.

Motion Pictures

The technique and principles of spinal anæsthesia—Dr. Kenneth M. Heard, Department of Anæsthesia, St. Michael's Hospital, Toronto.

Surgical treatment of traumatic stricture of the urethra—Dr. Oscar Mercier, Hotel-Dieu Hospital, Montreal.

A new surgical method to improve the blood supply to the heart—Dr. Mercier Fauteux, Department of Physiology, McGill University, Montreal.

Uretero-sigmoid anastomosis and cystectomy—Drs. Robin Pearse and R. A. McComb, Toronto General Hospital, Toronto.

Self-selection of diet experiment—Dr. Clara M. Davis, Winnetka, Ill.

Diseased and healthy conditions of the larynx—Dr. G. E. Tremble, Royal Victoria Hospital, Montreal.

Arthritis — Dr. Hagar Hethrington, St. Michael's Hospital, Toronto.

Subtotal gastric resection (Hofmeister-Finsterer modification of Billroth II) — Dr. Gavin Miller, Royal Victoria Hospital, Montreal.

The functional treatment of fractures—T. J. Smith & Nephew, Limited, Hull, Yorks, England.

ENTERTAINMENT

The various entertainment committees have been busy all winter arranging events medical and non-medical which are certain to have an appeal to visitors. There are four committees whose duties come under the heading of hospitality. These are: Entertainment, Ladies, Young People and Golf. Mention has already been made of activities planned by the Entertainment and Golf Committees. In this issue we are announcing a part of the program arranged by the Ladies' and Young People's Committees. It is not yet possible to announce the complete program of all these committees, but below we give a diary of the events as they have been arranged:

MONDAY, JUNE 19TH

12.30 p.m.—Luncheon, to be addressed by a prominent Montrealer on a subject dealing with the history of Quebec under the old régime.

4.00 p.m.—Afternoon Tea to the wives of members of Council. Guests will be entertained by Mrs. F. S. Patch at her home, 3156 Westmount Boulevard.

Jeanne Mance
The first Nurse in Montreal

8.30 p.m.—Public Address, Ritz-Carleton Hotel, by Professor E. P. Cathcart, Professor of Physiology, University of Glasgow. Under the auspices of the Committee on Nutrition of the Canadian Medical Association.

TUESDAY, JUNE 20TH

12.30 p.m.—Luncheon. Address by Sir Arthur MacNalty, London.

8.30 p.m.—Dinner to members of General Council. Hosts—the Quebec Division of the Canadian Medical Association together with the Montreal Medico-Chirurgical Society and la Société Médicale de Montréal.

8.30 p.m.—Wives of Members of the General Council will be guests at dinner of the Ladies' Committee.

WEDNESDAY, JUNE 21ST

1.00 p.m.—Luncheon, to be addressed by provincial and civic dignitaries.

4.00 p.m.—Afternoon Garden Party for the ladies at the residence of Mrs. Arthur Drummond, Beaconsfield.

8.30 p.m.—Annual Meeting of the Association.

10.00 p.m.—Reception and Dance.

THURSDAY, JUNE 22ND

1.00 p.m.—Luncheon with special speaker.

4.00 p.m.—Afternoon Garden Party for the ladies at the home of Mrs. William Birks, St. Bruno.

7.30 p.m.—Alumni and Private Dinners.

10.00 p.m.—Dance, Normandie Roof, Mount Royal Hotel.

FRIDAY, JUNE 23RD

1.00 p.m.—Golf Tournament, Royal Montreal Golf Club, Dixie.

7.30 p.m.—Golf Dinner, Royal Montreal Golf Club, Dixie.

Royal Montreal Golf Clubhouse, Dixie, Que.

Young People

Young people attending the convention with their parents will be interested to know of the plans that have been completed for their entertainment while in Montreal. The program has been especially designed for those of teen-age and includes many features of interest. On one day a sightseeing autobus tour will be made to all the principal places of interest around the city, announcers accompanying each bus to point out the features of historical and architectural interest. On another day there will be tours of inspection of a ginger-ale factory and of an ice-cream plant. Playing privileges have been arranged with city tennis and golf clubs for those interested in these games.

The Committee has arranged to spend one whole day at the Domaine d'Esterel in the Laurentian mountains. This last is one of the show places among Eastern Canada's play spots, and we are more than fortunate in having an opportunity of taking our young visitors there. A very reasonable rate has been extended which will allow the entire use of the many entertainment facilities, and the day there will be a memorable one. Indeed, it is quite possible that many of the ladies will wish to make the trip, and our plans are prepared for this eventuality. Incidentally, the young people's program is being planned to allow them to participate in the social program of the adult members whenever this is possible.

REGISTRATION

Registration may be made at Convention Headquarters from June 19th to 22nd. A booth will be open from 8.30 a.m. to 6 p.m. Membership in good standing in the Canadian Medical Association constitutes eligibility for registration, except in the case of regular medical practitioners from other countries who are entitled to register as guests. Interns, nursing supervisors and others who may wish to attend as visitors should obtain a card or note from a member of the Registration Committee. Canadian practitioners who are not members of the Canadian Medical Association may register upon the payment of the annual fee of ten dollars. The Registration Booth will also serve as a centre of general information, and for programs for young people and ladies.

TRANSPORTATION

Identification Certificates may be obtained from the office of the General Secretary, 184 College Street, Toronto. These certificates entitle the purchaser to round-trip fare at one and one-third of the adult normal one-way first class or coach fare.

Tickets may be purchased under the identification certificate plan on the following dates:

From British Columbia, June 11th to 17th, inclusive;

From Alberta, June 12th to 18th, inclusive.

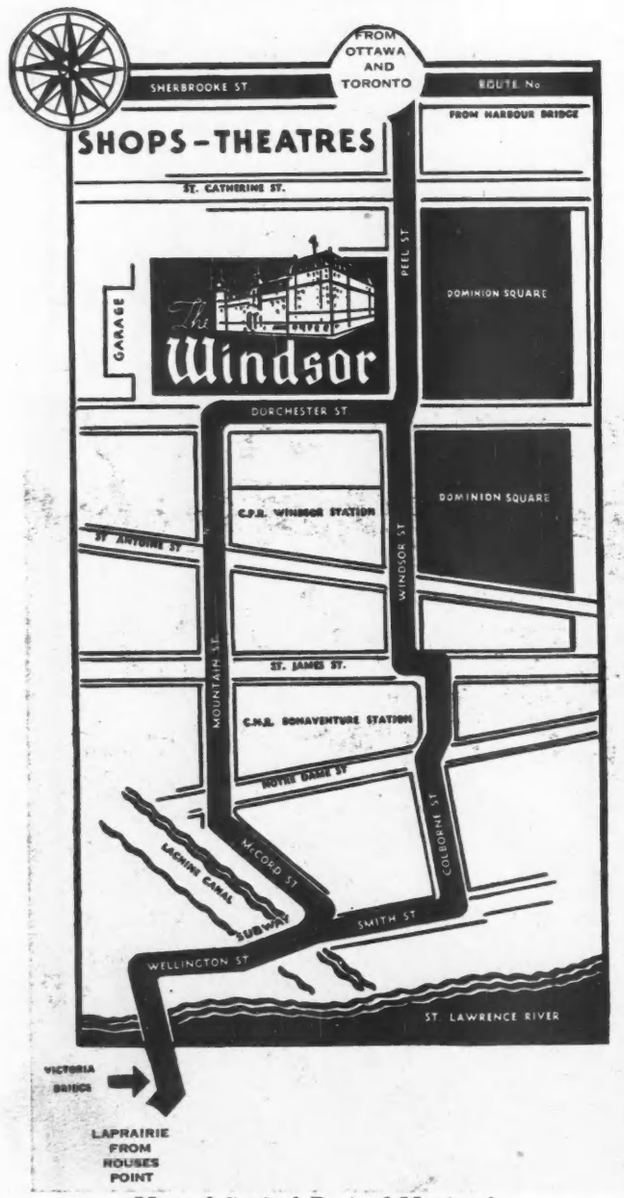
View, in part, of Montreal Harbour

From Saskatchewan, Manitoba, Ontario, Quebec and the Maritime Provinces, June 13th to 19th, inclusive.

The return limit is thirty days, in addition to date of sale. Passengers must reach original starting point not later than midnight of the final return limit.

Round-trip tickets will be sold at the rate of one fare and one-third of current fares, plus 25 cents, upon presentation of **Identification Certificates** to the ticket agent at time of purchase of ticket, going and returning via same route, or going via one authorized route and returning via any other authorized route.

Please inquire of your ticket agent in reference to summer tourist rates which may be in effect at the time of your departure. It is possible that these rates may be on a lower basis than Identification Certificate Plan fares.



Map of Central Part of Montreal

HOUSING

The Committee on Housing would appreciate it if those attending the convention would register early. The following is a list of hotels and their rates.

MONTREAL HOTELS

DAILY RATES - EUROPEAN PLAN

	Single room without bath	*Single room with bath*	*Double room without bath*	*Double room with bath*
Windsor Hotel....	Nil	$4.00	$4.50	$7.00
Mount Royal Hotel	Nil	4.00	4.50	7.00
Ritz-Carlton Hotel	Nil	5.00	Nil	8.00
Queen's Hotel.....	$1.50 & 2.00	2.50 to 3.50	3.00	3.50 4.00 4.50
Berkeley Hotel....	Nil	3.00 3.50	Nil	5.00 6.00
Hotel De LaSalle..	Nil	3.00 3.50	Nil	4.00 4.50
Ford Hotel.....	1.50 & 1.75	2.00 to 2.50	2.50 to 2.75	3.00 to 5.00

COMMERCIAL EXHIBITS

PICKER X-RAY OF CANADA LIMITED

57 Bloor Street West, Toronto

Booth No. 1

Picker X-Ray of Canada Limited will exhibit some of its latest developments in shockproof x-ray equipment and also the new fluorescent tube illuminators which provide the finest diagnostic viewing light evenly distributed over the entire viewing surface.

J. A. DUCKETT

2014 Bleury Street, Montreal

Booths Nos. 2 and 3

Duckett's establishment, founded 27 years ago, the largest of its kind in Canada, specializes in orthopædic apparatus, artificial limbs, special braces for different fractures, trusses, foot-plates, physiological supports; supplies the Canadian National and Canadian Pacific Railways, the Quebec Compensations Commission, etc.

J. A. Duckett is orthopædic technician to the Children's Memorial Hospital; Montreal General Hospital; Montreal Children's Hospital; Royal Victoria Hospital; Shriners' Hospital; Western Hospital.

Duckett's artificial limbs, orthopædic appliances, trusses, abdominal belts, etc., are scientifically made and fitted to each individual case, as prescribed by doctors. No agents—No peddlers.

DOWN BROS. LTD.

143 College Street, Toronto

Booth No. 4

Down Bros. Ltd., 143 College Street, Toronto, are displaying a comprehensive range of hand-forged stainless steel surgical instruments, including a large number of recent design by British, American and European surgeons.

PARKE, DAVIS & COMPANY

Walkerville, Ont.

Booths Nos. 5, 6, 7 and 8

Information regarding the numerous scientific achievements of the Parke, Davis & Co. Laboratories may be obtained at this attractive exhibit.

On display will be found such products as Mapharsen, Adrenalin, Pitocin, Pitressin, Theelin, Theelol, Antuitrin-S, Dilantin, various Biologicals and Pollen Extracts.

Members of the Parke-Davis staff will be glad to tell you about recent accomplishments of their research workers.

MERCK & COMPANY LTD.

Montreal

Booth No. 9

RECKITTS (Over Sea) LIMITED

1000 Amherst Street, Montreal

Booth No. 10

First used in England six years ago, "Dettol" Antiseptic was introduced to the Canadian medical profession last year. Its increasing use at leading hospitals is reflected in the many references to it in the literature. Reprints and extracts are obtainable on request. It is particularly recommended for use in obstetrics and skin disinfection, as it has been demonstrated that 30 per cent "Dettol" or "Dettol" Obstetric Cream will render the skin insusceptible to infection by hæmolytic stretococci for at least two hours, unless grossly contaminated. (*Vide* Colebrook, *British Medical Journal*, October 21, 1933, page 723.)

SCHERING (CANADA) LIMITED

P.O. Box 358, Place d'Armes, Montreal

Booth No. 11

Biological and Pharmaceutical Products will exhibit: Sex hormones: Progynon, Proluton, Oreton; Saraka for constipation; Medinal, sedative and hypnotic for oral, hypodermic and rectal administration; Uroselectan-B for intravenous and retrograde application in pyelography.

CASGRAIN & CHARBONNEAU, LIMITED

Montreal

Booths Nos. 12 and 13

THE ANGLO-FRENCH DRUG COMPANY

Montreal

Booth No. 14

CHARLES E. FROSST & COMPANY

Montreal

Booth No. 15

LEDERLE LABORATORIES INCORPORATED

30 Rockefeller Plaza, New York

Booth No. 16

Lederle Laboratories, Inc., are featuring their Solution Liver Extract Parenteral, 1 c.c. vial containing 15 U.S.P. units, Pollen Antigens, and Poison Ivy Extract. Pneumonia typing serum, pneumonia sera for treating various types. Vitamin B Complex, Vi-Delta products, and Allergenic Extracts are also displayed.

LABORATORY POULENC FRERES OF CANADA, LIMITED

204 Youville Square, Montreal

Booth No. 17

Dagenan (M & B 693)—In the chemotherapy of pneumoccocal, gonococcal and meningococcal infections. Also the soluble form of Dagenan, Soludagenan, for intramusclar, intravenous, and intrathecal administration.

Other outstanding Poulenc specialties will be displayed, including: Soneryl, Neptal, Stovaginal, and Novarsenobenzol-Billon.

SMITH & NEPHEW LIMITED

378 St. Paul Street West, Montreal

Booth No. 18

Smith & Nephew, Limited, Surgical Dressings Manufacturers, will present a comprehensive display of their medical and hospital specialties, including the well-known Elastoplast Elastic Adhesive Bandage, Dressings and Plasters, also Cellona P.O.P. Bandages.

The following films, produced in British hospitals and clinics can be viewed privately: "The use of Elastic (Elastoplast) Plaster in Modern Surgery"; "The Functional Treatment of Fractures"; "The Treatment of Tuberculosis Disease in the Hip and Spine in Children".

COW & GATE (CANADA) LTD.

Gananoque

Booth No. 19

Cow & Gate (Canada) Limited make and sell a complete line of infant foods originated by their parent company, Cow & Gate Limited, in England, during the last fifty years.

The company hold two Royal Warrants and 137 awards, including 48 gold medals.

Cow & Gate milk foods are subject to scientific control at every point in their manufacture. A full range can be seen at the Exhibition.

ABBOTT LABORATORIES LIMITED

388 St. Paul Street West, Montreal

Booth No. 20

The Abbott representatives are looking forward to your visit. A complete outfit for the administration of Abbott Intravenous Solutions will be displayed for your inspection. You will also become acquainted with the new Abbott specialties, such as Klotogen, the new antihæmorrhagic factor, Aminoacetic Elixir, Argental, Nicotinic Acid, etc.

AYERST, McKENNA & HARRISON, Limited

McGill Building, Montreal

Booth No. 21

Ayerst, McKenna & Harrison Limited will feature: "A.P.L.", the chorionic, gonadotropic hormone; "Emmenin", the orally-active, œstrogenic, placental hormone; and "Alphamin", a vitamin and mineral supplement containing Vitamins A, B_1, C, D, E, ferrous sulphate exsiccated, acid calcium phosphate, copper, manganese and iodine.

A. WANDER LIMITED

Peterborough, Ontario

Booth No. 22

You are cordially invited to visit the exhibit of A. Wander Limited at the west end of the Rose Room. Ovaltine will be served as usual, and high-class medicinal products will be on display such as, Alocol, Wander Brand Malt Extract and Cod Liver Oil, Wander Malt Extract with Hæmoglobin, and Nutromalt. Kindly leave us your address for samples and literature.

THE WINGATE CHEMICAL COMPANY, Limited

378 St. Paul St. West, Montreal

Booth No. 23

The Wingate Chemical Company, Limited presents Sandoz Pharmaceutical Products.

Bellergal—A modifier of the body's response to excessive vago-sympathetic irritability.

Gynergen—(Ergotamine tartrate), the classical treatment of migraine.

Calcibromat—Combining the anti-exudative, anti-inflammatory anti-pruritic and sedative properties of calcium and bromine for parenteral administration in weeping and itching dermatoses, with oral forms for classic bromide indications.

Calcium-Sandoz—(The original calcium gluconate), now the improved double salt Ca-glucono-galactagluconate.

WHITE LABORATORIES INC.

Newark, N.J.

Booth No. 24

BAXTER LABORATORIES of Canada, Limited

201 Weston Road, Toronto

Booth No. 25

Baxter's Intravenous Solutions in the Vacoliter. The convenient method of administering safe, sterile dextrose and saline solutions. Vacuum sealed—tamperproof.

Baxter's Blood Transfusion Set—citrated indirect method. Blood transfusions are simplified and blood kept free from contamination.

Transfuso Vac Set. A new and vastly improved method of transfusion and storage of blood under vacuum. The perfect blood bank assembly.

THE FOREGGER COMPANY INC.

New York

Booth No. 26

FERRANTI ELECTRIC LIMITED

Mount Dennis, Toronto

Booth No. 27

HANOVIA CHEMICAL & MANUFACTURING COMPANY

Chestnut Street and N.J.R.R. Avenue, Newark, N.J.

Booth No. 28

An invitation is extended to all to visit our Booth. The very latest in therapeutic equipment will be on display. Self-lighting ultraviolet quartz lamps, Sollux Radiant Heat Lamps, Short and Ultra-Short Wave Generators. Competent and courteous representatives will be on hand to greet you.

CHAS. H. PHILLIPS CHEMICAL CO.

Windsor

Booth No. 29

H. G. FISCHER & CO.

2323 Wabansia Avenue, Chicago, Ill.

Booth No. 30

The latest Fischer Model of Short Wave, X-ray and other apparatus, to be exhibited and demonstrated by H. G. Fischer & Co., will interest physicians because of their many unique features of design and performance. The complete Fischer line includes shockproof x-ray apparatus, short wave units, combination cabinets, galvanic generators, ultra-violet and infra-red lamps; many other units, accessories and supplies. Physicians attending the convention are invited to ask for demonstrations of models in which they are interested, or to consult with Fischer representative regarding techniques made available by Fischer apparatus.

OXYGEN COMPANY OF CANADA, Limited

2549 St. James St. West, Montreal

Booth No. 31

In Space No. 31 will be found the latest improvements in anæsthesia gas machines, oxygen tents, and other types of oxygen therapy equipment, including the well-known Heidbrink and Ohio models which have proved so satisfactory over a long period, and all of which have proved their worth throughout Canada. Main office: Cleveland, Ohio; Heidbrink division, Minneapolis, Minn.

THE MENNEN COMPANY

Newark, N.J.

Booth No. 32

The Mennen Company will exhibit their two baby products—Antiseptic Oil and Antiseptic Borated Powder. These products are used by many leading hospitals in Canada, and are generally recommended by nurses and physicians. Be sure to register at the Mennen exhibit, and receive your kit containing demonstration sizes of their shaving and after-shave products; also, for the lucky number prize drawing to be held at the close of the convention for DeLuxe Fitted Leather Toilet Kits.

THE DOHO CHEMICAL CORPORATION

58 Varick St., New York

Booth No. 33

New York, Montreal, London

An established preparation for the osmotherapeutic treatment of otitis media is explained.

Auralgan exhibit shows anatomical picture of the ear and process of osmotic action, together with many slides in colour pertaining to diseased drum membranes, corrosion, maceration and obscured landmarks.

Auralgan is used in place of phenol glycerin but contains no phenol.

THE DENVER CHEMICAL MFG. COMPANY

New York

Booth No. 34

MILQO LIMITED

Hamilton, Ontario

Booth No. 35

Enjoy yourself at this convention, making the Vi-Tone Space your headquarters. There you will find that ever-refreshing drink, "Vi-Tone", ready for you. Yes! By all means bring your friends along; you are welcome. Vi-Tone contains complete proteins, is delicious and nourishing.

S. H. CAMP & COMPANY OF CANADA, Limited

875 Mercer Street, Windsor, Ont.

Booth No. 36

You are cordially invited to visit Space No. 36 where S. H. Camp & Company of Canada, Ltd., manufacturers of scientific supports, will have representatives to instruct you in the latest developments of Camp Supports, show you samples, and fully explain their use and application. Supports are constantly being improved to meet changing needs and these approved phases will interest you.

WINTHROP CHEMICAL COMPANY, INC.

Dominion Square Building, Montreal

Booths Nos. 37 and 38

The Winthrop Chemical Company extends a cordial invitation to visit their booth, where representatives will gladly discuss the modern advances in chemotherapy, especially Neoprontosil (formerly Prontosil), because of its beneficial therapeutic effect and lessened toxicity. Neoprontosil is now available in tablets for oral administration as well as in ampules of 2.5 per cent and 5 per cent solution for parenteral use. Other popular Winthrop pharmaceutical preparations to be displayed are: Prontylin; Vitamin products including Drisdol, Drisdol with vitamin A capsules, Betaxin (cystalline vitamin B_1) Becetax and Cantaxin (vitamin C); Campolon; Neosalvarsan; Cyclobis—a solution of bismuth in oil, for the intramuscular treatment of syphilis—Korotrin (formerly Antophysin) the anterior pituitary-like gonadotropic hormone from pregnancy urine in stable powder form.

JOHN WYETH & BROTHER, Inc.

Walkerville, Ont.

Booths Nos. 39 and 40

John Wyeth & Brother Inc. have prepared a very striking exhibit featuring S.M.A.—their new preparation for infant feeding.

The Wyeth representatives in attendance at the exhibit will gladly furnish all information, literature and clinical supplies of S.M.A. and other leading Wyeth specialties, such as Amphojel, and Hematinic Plastules.

E. R. SQUIBB & SONS OF CANADA, LIMITED

36 Caledonia Road, Toronto

Booth No. 41

At the Squibb space, clinicians may see:

A quick method for determining pH in office or home.

The new chemo-therapeutic agent for the oral treatment of the menopause.

A new tablet, both cholagogue and choleretic.

Special package and procedures for the treatment of Atrophic Rhinitis and Otosclerosis.

A slowly-acting Epinephrine, and many other valuable therapeutic agents.

MEAD JOHNSON & COMPANY of CANADA, LTD.

Belleville, Ontario

Booths Nos. 42, 43 and 44

Two new Mead products will be displayed at the exhibit of Mead Johnson & Company of Canada, Limited. These are Mead's Thiamin Chloride Tablets and Mead's Ascorbic Acid Tablets.

The new increased potency of Mead's Brewers' Yeast (powder and tablets) will also be featured.

GENERAL X-RAY CORPORATION

Chicago

Booths Nos. 45, 46 and 47

SIEMENS-REINIGER (Canada) LIMITED

18 Dominion Square Bldg., Montreal

Booths Nos. 48 and 49

You are invited to inspect the Universal Siemens "Camera-Helioscope" combination radiographic-fluoroscopic apparatus and the various "Heliosphere" X-Ray units. A full line of X-Ray accessories will be on display.

Demonstrations will be given with the Ultra-short-wave Generators, "Ultratherm" and "Isotherm". Our new Cadmium Lamp and a new simultaneous recording 3-lead Electro-Cardiograph will be shown for the first time.

THE CANADIAN KODAK CO. LIMITED

Toronto 9

Booth No. 50

The Canadian Kodak Co., Limited will have on display a full line of equipment and materials for use in radiography and clinical photography. Mr. Paul Berty, special representative, will be in charge.

BECTON, DICKINSON & CO.

Rutherford, N.J.

Booth No. 51

Becton, Dickinson & Co. will show a complete line of syringes and needles, thermometers, bandages, Asepto syringes, and blood pressure instruments, and, as a feature of the exhibit, they will present a demonstration of actual syringe making, showing how the glass is formed into a syringe. This is the first time that this demonstration has been shown in this part of Canada, and we will welcome questions from doctors concerning the manufacture of syringes.

THE COCA-COLA COMPANY OF CANADA, LIMITED

Montreal

Booth No. 52

THE DRINKS ARE ON US

We cordially invite all convention guests to visit our Space, No. 52, and enjoy the "Pause that Refreshes", with our compliments. This is a standing invitation for the duration of the convention. We hope you will visit us whenever you feel the need of wholesome refreshment.

CANADIAN CANNERS LIMITED

44 Hughson Street, South, Hamilton

Booth No. 53

Exhibit comprises series of photographs in natural colour portraying the use of Aylmer Strained Infants' Foods and Aylmer Chopped Foods for Juniors.

The use of Aylmer fruits in water and Aylmer vegetables in diabetic, obesity and low carbohydrate diets is also illustrated in a series of natural coloured photographs.

Aylmer special foods for the feeding of infants, children and for special diets will be available for inspection.

INGRAM & BELL, LIMITED

Toronto

(Poster)

THE J. F. HARTZ CO., LIMITED

Toronto

(Poster)

REPORT OF THE EXECUTIVE COMMITTEE

The Executive Committee met in the Royal York Hotel, Toronto, on March 13 and 14, 1939. The following were present: Drs. T. H. Leggett (*Chairman*), A. T. Bazin, Sclater Lewis, Léon Gérin-Lajoie, J. E. Bloomer, A. E. Archer, A. G. Nicholls, J. C. Gillie, O. C. Trainor, Duncan Graham, J. R. Corston, F. S. Patch, Gordon Kenning, K. A. MacKenzie, Harvey Agnew and T. C. Routley. Regrets at unavoidable absence were received from the following members: Drs. W. A. Jones, W. J. P. MacMillan, H. R. Clouston and A. E. Macaulay.

The following were present by invitation: Dr. Wallace Wilson, Vancouver, Chairman of the Committee on Medical Economics; Dr. C. J. Veniot, M.P., Bathurst, Chairman of the Committee on Legislation; Dr. W. H. Delaney, Quebec, Secretary of the Section of Military Medicine; and Dr. R. I. Harris, Toronto, Chairman of the Committee on Constitution and By-Laws.

During the two days that the Committee was in session a great many matters of interest and importance were considered, reference to some of which will be found herein.

MEMBERSHIP

During the month of December, 1938, a special drive for new members in the Association was carried out by six of the nine provinces, 2,179 complimentary issues of the December *Journal* being sent to non-members. This resulted in an enrolment of 319 new members during the first ten weeks of the year 1939.

CANCER

The organization of the Department of Cancer Control and the Canadian Society for the Control of Cancer moves on apace. Both organizations now have active branches in the nine provinces.

The handbook on cancer which has been distributed very widely to the medical profession of Canada is in demand in many parts of the world. Orders have been received for a large number of copies from Great Britain, India, Africa, New Zealand and Australia.

FINANCES

The financial statement of the Honorary Treasurer, covering the calendar year 1938, was considered in detail as preliminary to its presentation to General Council in June. On the year's operations, the Honorary Treasurer reported a surplus balance of $4,167.96.

HISTORY OF THE CANADIAN MEDICAL ASSOCIATION

We still have over three hundred copies of the History of the Canadian Medical Association remaining unsold. It was agreed to clear these out at the nominal price of $1.00 per copy, postage paid.

THE JOURNAL

A general review of the *Journal* was presented by the Editor and the Managing Editor, showing that, from the point of view of material for publication, advertising contracts, and other relative matters, the year 1938 compared very favourably with previous years.

NUTRITION

The Committee on Nutrition reported that during the past year arrangements had been made for addresses on the subject of nutrition to be given in various parts of Canada by Professor E. V. McCollum of Johns Hopkins University; Professor L. H. Newburg of the University of Michigan, Ann Arbor; Sir Edward Mellanby, Director of the Medical Research Council of Great Britain; Sir John Boyd Orr, Director of the Rowett Institute, Aberdeen, Scotland; and Professor E. P. Cathcart, of Glasgow, Scotland.

PREGNANCY SURVEY IN MANITOBA

The pregnancy survey in Manitoba, to which the Association has contributed $2,000, is progressing satisfactorily, according to the Chairman of the Committee, Dr. J. D. McQueen. Out of 13,432 live births in Manitoba in 1938 there were only 38 deaths, a rate of 2.83 per thousand live births.

CEREMONIAL

A great deal of time was given to the consideration of the report of the Ceremonial Committee presented by Dr. Bazin. This report aimed to set forth in minutest detail the conduct of an annual meeting from beginning to end. It is proposed to apply this formula to the coming meeting in Montreal. While no radical changes in set-up or arrangement have been effected, it is expected that the plan will facilitate the carrying out of all details to the satisfaction of the members and guests.

FEDERATION

Dr. R. I. Harris, Chairman of the Committee on Constitution and By-Laws, reported that progress is being made in further discussing Federation with the two provinces which have not yet become Divisions, namely, New Brunswick and Manitoba.

DEPARTMENT OF HOSPITAL SERVICE

Questions concerning interim licenses for interns; x-ray apparatus; tariff revisions; Joint Study Committee on Medical Education; internships, licensure and practice; various responsibilities of nurses to hospitals; group hospitalization; schools for laboratory technicians; were presented by Dr. Harvey Agnew, Associate Secretary in charge of the Department of Hospital Service.

CLASSIFICATION OF THE MEDICAL PROFESSION FOR NATIONAL EMERGENCY

Dr. W. H. Delaney, of Quebec, Secretary of the Section of Military Medicine, was present by invitation to discuss with the Committee details connected with the compilation of information on the medical profession of Canada which would be of value in the event of national emergency. Plans similar to those put into effect by the British Medical Association are being worked out, in cooperation with the official departments of government concerned. Complete details on this inquiry will be available to the profession in the not far distant future.

MEDICAL ECONOMICS

Dr. Wallace Wilson, of Vancouver, Chairman of the Committee on Medical Economics, was present by invitation to present a most thorough and comprehensive report dealing with this subject. Dr. Wilson had previously put himself in touch with the several provincial medical associations, to obtain their views with regard to Health Insurance and allied problems. A number of recommendations brought forward by the Committee were referred for further study and will be presented to General Council at the coming meeting in June.

LEGISLATION

Dr. C. J. Venoit, M.P., of Bathurst, Chairman of the Committee on Legislation, was present by invitation and reported upon a number of matters of legislative interest to the Association. He referred to the debate on Health Insurance which had recently taken place in the House of Commons. He outlined the import of Bill 13, an Act to amend the Food and Drugs Act, which, in the opinion of the Committee, improves the Act. The changes suggested had previously been approved by the Association's Committee on Pharmacy. Further questions of legislation which were discussed dealt with the Venereal Disease Act, the Dominion Council of Health, and Income Tax, all of which were taken under advisement by Dr. Veniot for presentation to a later meeting of this Committee.

CODE OF ETHICS

It was agreed to proceed with the printing of the Code of Ethics of the Association as approved at the Halifax meeting; and, in the near future, a copy will be available to each member of the Association.

THE NEXT ANNUAL MEETING

The various committees concerned with the preparation of the Montreal meeting report progress. It appears that all details associated with the coming meeting are well in hand, and that a highly successful convention may be anticipated.

SENIOR MEMBERS

The Executive Committee will nominate to General Council for election to Senior Membership at the Montreal meeting the following gentlemen: Drs. Glen Campbell, Vancouver; W. S. Galbraith, Lethbridge; T. A. Patrick, Yorkton; W. Harvey Smith, Winnipeg; R. D. Rudolf, Toronto; John Graham, Bolton; J. E. Dubé, Montreal; H. D. Hamilton, Montreal; J. M. Barry, Saint John; C. A. Webster, Yarmouth.

IMMIGRATION AND REGISTRATION OF FOREIGN-BORN DOCTORS

Close contact is being maintained with the Department of Immigration at Ottawa with respect to applications which arise from time to time from foreign-born doctors desiring to locate in Canada. Having carefully reviewed the situation, the Executive Committee is of the opinion that the medical schools of Canada are graduating more than a sufficient number of doctors for Canadian needs; and, therefore, in the opinion of the Executive Committee there is at present no need for the importation of doctors into Canada.

RADIO BROADCASTING

Considerable discussion took place with regard to the whole question of radio in relation to medical affairs, and a sub-committee was appointed to bring in a report to the next meeting of the Executive.

AMENDMENTS TO THE CHARTER OF THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

The Committee approved of the action of the Royal College of Physicians and Surgeons of Canada in seeking an amendment to its Charter in order to obtain authority to certify and register specialists; and to include the certificate of the Medical Council of Canada as one of the requisites of those eligible to take the examinations of the College.

OTHER ITEMS

A large number of other items dealt with by the Committee were referred to the appropriate study committees for consideration and action.

All of which is respectfully submitted.

T. C. ROUTLEY,
General Secretary.

Hospital Service Department Notes

Hospitals and War Emergencies

The active preparation for war possibilities by London and other British and French hospitals has led many people to conjecture on the desirability of some such preparation on the part of civilian hospitals near the sea coast on this continent. With the development of regular transatlantic and transpacific air schedules, transpolar flights, ocean refueling for planes and submarines, substratosphere planes and other kaleidoscopic changes, the possibility of air raids of cities on or near the Atlantic and Pacific coasts must be given serious consideration.

Taking the viewpoint that Canada would find it exceedingly difficult to remain neutral should either Great Britain or the United States be attacked, Colonel Bovey, of Montreal, writing in the April issue of the *Canadian Hospital*, urges that Canadian civilian hospitals be prepared for various possibilities. Raiding machines would probably be small, cross ng the ocean as deckloads of comparatively small vessels; spots attacked would probably be of similar area to those attacked during the Great War, but the striking force of modern aeroplanes is at least ten times greater. Lewisite and cacodyl-isocyanide are more vicious than any war time lethal gases. There is said to be a new preventive for dichlorethyl sulphide, but that does not affect the risk of contagion and consequent therapeutic difficulties. Sabotage would probably involve the use of incendiary thermite bombs.

Although it is not likely that Canadian cities would suffer serious raids, the author does urge civilian hospitals in danger areas to survey the following details:

1. Accommodation—wards, operating rooms, sanitation.
2. Adequate reserves of medical and surgical supplies.
3. Reserve of personnel—doctors, nurses, cooks, etc.
4. Reserve of material—beds, rubber gloves for mustard gas cases, kitchen supplies.
5. Special reserves—battery lighting, fuel, ice reserves, etc.
6. Transport services.
7. Coordination with the St. John's Ambulance Corps and the Red Cross.
8. Replacement of personnel and material—normal and war wastage.

Fortunately for our peace of mind, as the *Canadian Hospital* states editorially, we have at our side not an avaricious nation, but one exceedingly friendly and one which would quickly leap to our assistance should the integrity of Canada be threatened. As for attack from abroad, Lieut.-Col. Haig Shekerjian of the United States Chemical Warfare Service, speaking to a Canadian scientific society a few weeks ago, stated that the dangers, while by no means absent, were not so great as feared by some. Large areas cannot be blotted out by gas; it would be exceedingly difficult to effect the necessary concentration, particularly with the raiding base at some distance. Such an attack could cause considerable disorganization, cause some casualties, and affect the morale of the people. Explosive and incendiary bombs would be more destructive.

Gas masks give full protection against phosgene and other gases. Mustard gas requires contact for some minutes before blistering occurs. Chemists are not expecting many new gases but, of course, are on the alert lest some new compound show unexpected properties. No army, desiring to avoid suicide, would liberate a gas for which it at least did not have an antidote. Provided gas masks be available, the greatest danger in case of a gas attack is panic and disorganization, due to fear of unknown new gases.

Whether or not an air raid on one of our cities would be very destructive of life or property, there would seem to be a reasonable possibility of raid should Canada find herself at war. Moreover, our hospitals should give some thought to the necessity of providing accommodation for troops during mobilization before embarkation, of caring for those injured or sick while on home defence, and of helping out in the case of those invalided back. In view of the amazing rapidity of change in the world picture to-day and the ruthlessness with which unscrupulous dictators destroy lands and peoples some thought might readily be given to these possibilities by the staffs and directors of our hospitals.

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

The Cancer Campaign

The Canadian Society for the Control of Cancer

Although the Society has only been active since November, 1938, definite evidence is gradually being accumulated to indicate that its formation was warranted. Several cases are now recorded in which as a result of the educational campaign early treatment was instituted.

The people show great interest in the talks which are being given on the subject of cancer, and one receives the impression that perhaps the medical profession does not sufficiently appreciate the growing interest of the public in all matters pertaining to health problems. It also appears that as a result of the educational campaign being carried on among the laity by the Canadian Society for the Control of Cancer and among the medical profession by the Department of Cancer Control of the Canadian Medical Association, increasing interest is being focused on that most important problem—Cancer Research.

The four most active branches of the Society are Prince Edward Island, British Columbia, Alberta and Ontario. Though British Columbia, with a membership of 1,700, would appear to lead the way, yet Prince Edward Island, with one-eighth of the population and a membership of 227, has on the basis of members in proportion to population a right to first place.

The membership in Alberta has increased rapidly in the past month. No doubt the several public addresses given there during March are largely responsible for this. On March 2nd Dr. J. S. McEachern gave a most excellent address before the Current Events Section of the Men's Canadian Club. On March 10th he and Mr. J. B. Corbet, the very efficient secretary of the Alberta Branch, spoke over the radio on time sponsored by the Canadian Legion. In addition to this Mr. E. T. Chritchley, the vice-chairman of the Alberta Branch, spoke over Station CJCJ, the time being kindly provided by the Junior Chamber of Commerce of Calgary. The Ladies Canadian Club of Calgary had the pleasure of listening to Dr. McEachern on March 15th.

In Ontario a public meeting was held in Niagara Falls on March 30th. The speakers were Dr. W. J. Deadman, of Hamilton and Dr. C. C. Ross. This meeting was sponsored by the Local Council of Women, and as a result of it a Unit of the Canadian Society is being formed.

The Executive Secretary spoke at the regular monthly meeting of the Essex County Medical Society on Tuesday, March 7th, and a committee composed of Drs. MacCabe, Brien, Asselstine, Laing, and McCormick was appointed to form a Unit of the Society in Windsor.

The Kiwanis Club of Orillia, at noon on Monday, March 20th, and the Kiwanis Club of Barrie, on the evening of the same day had as their guest-speaker the Executive Secretary of the Society.

The Civitan Club of Toronto also had Dr. Ross speak to them at their regular luncheon meeting in the Royal York on March 23rd.

An organization meeting of the Hamilton Unit of the Society was held on April 4th in the Medical Arts Building.

Dr. W. H. McCuffin, of Calgary, has the honour of being the first medical man to take out a life-membership in the Society.

The Saskatchewan Branch, in cooperation with the United Commercial Travellers, has just started an active membership campaign. The Saskatchewan Anti-Tuberculosis League has been an active force in that province for many years, and as a result Saskatchewan has the lowest death rate from tuberculosis per province in the Dominion. It is believed that in much the same way the mortality from cancer can be substantially reduced.

Dr. A. D. Kelly, Secretary of the Ontario Medical Association, has communicated with all the hospitals of a hundred beds or more in Ontario concerning the formation of Cancer Study Groups. The response has been very favourable. Dr. G. Stewart Cameron and Dr. Kelly are at present preparing an itinerary, and will visit the various hospitals as soon as possible.

The Baker and Koch Cancer Treatment in New Zealand

The following is the report of an investigation into alleged cancer cures which has been sent to the Minister of Health for the information of the New Zealand Government. The report is the work of a committee consisting of Sir James Elliott, M.D. (chairman), Mr. H. Hardwick-Smith, F.R.C.S., Dr. J. O. Mercer, and Dr. T. R. Ritchie.

As you are aware, a medical committee was set up —we understand at the request of Dr. Ulric Williams and his colleagues Professor Brose and Mr. McCulloch —to investigate an alleged cancer cure to be tried at Wanganui, and strongly recommended to the notice of the Government by these gentlemen. The Investigation Committee which was accepted by Dr. Ulric Williams consisted of Sir James Elliott (chairman), president of the New Zealand Branch of the British Empire Cancer Campaign; Mr. H. Hardwick-Smith, F.R.C.S.; Dr. J. O. Mercer, M.R.C.P., pathologist, Wellington Hospital; Dr. T. R. Ritchie, director of the Division of Public Hygiene, Department of Health. The setting up of this committee was contained in your memorandum dated August 22, 1938.

The members of the Investigation Committee approached this inquiry with an open mind and the desire that some efficacy might be disclosed in these cures, even although one part of the treatment—namely, by Koch's fluid—had been investigated at various times in America during the past twenty years.

For the purpose of the investigation the committee proceeded to Wanganui on August 31, 1938, and carefully examined fifteen patients under treatment by Mr. McCulloch under the supervision of Dr. Ulric Williams. Professor Brose was, so he informed us, chiefly interested in this method of treatment as he was anxious to test in these cases a method which he had devised for testing the blood of patients to find if they had cancer or not, and if so the progress of this disease. It is right to say that this test approved by Professor Brose is not generally accepted.

Of the fifteen cases the committee, after investigation, decided that six of the patients had cancer and six were probably cancerous, but in the absence of confirmatory evidence the diagnosis at that time was open, and the remaining three cases were very definitely not cases of cancer. Of the six probable cases two were subsequently proved to be cancer by pathological examination. All the patients that we saw on this occasion had already been treated, so that we were given no opportunity of actually seeing the treatment given or of examining the fluids which had been used for the treatment.

We were especially interested in four breast cases which had been treated by local injections of fluid round the periphery of the breast ten days prior to our visit, and we understand that they had also been given an intravenous injection on August 30th. The results as we saw them on August 31st were as follows. In each case the whole of the breast and a varying but extensive surrounding area was completely gangrenous, black, and malodorous. All these patients had undergone the diet treatment previously. No temperature charts or case reports were available, but the Investigation Committee was able to get in some

cases reports and records from hospitals and medical practitioners in other parts of New Zealand where these patients had received advice or treatment. This was done with the knowledge and consent of Dr. Williams.

The Investigation Committee was invited to see these four breast cases again on September 14th because, we were informed, Professor Brose and Mr. McCulloch were leaving for Australia and were desirous that we should see the improvement that had taken place in the condition of these patients. We then definitely learned that the treatment given was the injection of Baker's fluid locally in the breast cases and also, in addition, intravenous injection of Koch's fluid in all cases. Mr. McCulloch gave the committee the impression that Baker's fluid (in the breast cases) destroyed only and exclusively and selectively all cancerous tissue, and that Koch's fluid searched out all cancer cells throughout the body wherever they might be and destroyed them.

In the opinion of the members of the committee the general condition of the patients showed no improvement. Two of the four cases were markedly worse. In all cases the gangrenous breasts had sloughed away together with surrounding tissue, extending in one instance from the centre of the breastbone to the posterior margin of the armpit and exposing a large raw area of breast muscle. In one case healing had already begun to take place from the margins of the raw area. The other patients had shown no sign of healing at that early stage and would require a considerable period for the healing of the large areas. There was a great amount of mutilation. In three of the four breast cases the diagnosis of cancer was confirmed microscopically by an examination of the separated breast tissue.

It proved that this second visit of investigation on September 14th was also to be our last. Quite unexpectedly Dr. Ulric Williams sent word that our investigations were to cease. You will remember, Sir, your efforts to induce Dr. Ulric Williams to reconsider this decision. He declined to do so. His last communication on the subject, under date December 16th, states:

"Since both Baker and Koch have written to me in the strongest terms declining to submit their products to test in their absence I have no alternative to breaking up negotiations with your committee."

The committee, although thwarted in its investigation in this way, has seen reports of investigations made into both the Baker and Koch treatment in the United States of America under more favourable conditions, and these reports have been very condemnatory of the treatment.

As a result of our observations and study of the cases seen at Wanganui we can make certain conclusions. We have no doubt that Baker's fluid is a powerful sclerotic agent and can cause great local destruction. Compared with surgical treatment destruction by a sclerosing or caustic fluid seems like a reversal to the treatment in the Middle Ages, causing unnecessary mental distress, delayed healing, and increased risk of septic infection. We have had no evidence whatever to show that Baker's fluid has any selective powers in the destruction of cancer cells. There is no real difficulty in removing the breast surgically or by crude destruction, but this is very far from a cure of the breast cancer and may delude the public mind. The danger of death from cancer of the breast lies in the great tendency of breast cancer, if not treated early and by substantial methods, to spread to the armpit, inside the chest, or into the bones, or elsewhere.

From our general knowledge and from the observations we were permitted to make in investigating the cases at Wanganui we have no reason whatever to suppose that Koch's fluid has any effect in curing generalized cancer.

All the evidence available, without exception, convinces your committee that the claim cannot be substantiated that the treatment which we saw practised at Wanganui has any merit as a cure or palliative for cancer. This claim that a cure has been found for cancer should never be made and promulgated until prolonged tests have shown that the claim is a reasonable one. . . .

Your committee considers that it is in the public interest that a statement should be made that our hope of finding anything useful in the treatment recommended by Dr. Williams and his colleagues has proved illusory.—Reprinted from the *Brit. M. J.*, 1939, **1**: 392.

Medical Societies

The Calgary Medical Society

On March 11, 1939, the members of the Calgary Medical Society held the monthly meeting at the Provincial Sanatorium at Keith, on the invitation of Dr. A. H. Baker, the superintendent, and the physicians of the staff. Meetings of our Society at this institution have been almost annual events over a number of years and are always looked forward to with anticipation. This year Dr. L. M. Mullen gave a splendid address on the progress and developments in a series of tuberculous patients over periods ranging from one to twelve years. This was illustrated by many radiograms. Following this interesting discourse, Dr. W. J. Downs gave an address on the treatment of the tuberculous patient which was splendidly illustrated by numerous diagrams and radiograms.

G. E. LEARMONTH

The Canadian Rheumatic Diseases Association, Quebec Division, Montreal

The next meeting will be held in the Montreal Neurological Institute, May 12th at 8.30 p.m. There will be a short business session and election of officers. The paper of the evening entitled "Bacteriology of rheumatic fever" will be given by Dr. M. W. McLellan. All members of the medical profession are cordially invited to attend.

District of Beauharnois Medical Association

The District of Beauharnois Medical Association met at Ormstown, March 24th, at the Stalker-Quintin clinic. There was a large attendance and the program was of practical interest. Dr. T. J. Quintin spoke on "Some common blood disorders and the newer conception of their treatment"; Dr. D. F. Fortin discussed "Dystocia in private practice"; Dr. M. R. Stalker presented two cases of "Fractured hip", and Dr. J. Moreau reported a case of "Primary carcinoma of the lung", supported by x-ray and biopsy findings.

The April meeting of this Association was held on April 21st at Huntingdon. Dr. Claude St. Onge presented a case of "Myocardial infarct". Dr. H. R. Clouston led the discussion in a symposium on the use of "Sulphapyridine". Dr. J. R. McEwen spoke on some cases of "Abnormal psychology as seen by a coroner". At the close of the meeting dinner was served at the Chateau Huntingdon.

The Montreal Physiological Society

At a meeting of this Society held on October 17, 1938, the following paper (in abstract here) was presented.

THE ROLE OF POTASSIUM IN FAMILIAL PERIODIC PARALYSIS.—Robert H. Pudenz, John F. McIntosh and Donald McEachern.

1. In a classical case of familial periodic paralysis attacks were associated with a marked fall of serum potassium. During recovery the serum potassium rose to normal.

2. Administration of potassium caused rapid disappearance of paralysis. Acetyl B methylcholine (mecholyl) and carbaminoylcholine (doryl) also brought about recovery, although no potassium was administered. Prophylactic doses of potassium have prevented the occurrence of attacks.

3. Attacks were induced by the ingestion of large amounts of glucose, with or without insulin, and by the administration of epinephrine or ephedrine.

4. Paralysis was not associated with a loss of potassium from the body. There was, however, a redistribution in which potassium was drained from the serum to meet the needs of the tissues. No significant change occurred in the concentration of sodium or other important electrolytes in the blood.

5. Persistent creatinuria was present during attacks and in the intervals. Creatinine excretion in the urine was highly variable.

6. Experiments have indicated that the chemical defect responsible for paralysis lies in the central nervous system and not in the muscles.

7. Familial periodic paralysis is an inborn error of metabolism.

On November 21, 1938, the following paper (in abstract here) was presented.

A CONTRIBUTION TO THE PATHOGENESIS OF PHYSICAL ALLERGY (ENDO-ANTIGEN AND EXPERIMENTAL ANAPHYLAXIS).—S. Karady.

The experiments performed in guinea pigs have resulted as follows.

1. Guinea pig serum was exposed to cold (–5° C.) or to heat (+58° C.) for 1½ minutes and injected into a group of normal guinea pigs. Three weeks later reinjection of similarly treated serum caused an anaphylactic shock when the serum injected had been exposed to the same physical condition, and no anaphylaxis resulted when the serum injected had been exposed to the opposite physical condition.

2. Exposure of guinea pig's hind legs to cold (–5° C.) or heat (+58° C.) followed three weeks later by injection of serum treated with cold or heat resulted in anaphylactic shock in the parallel-treated group but not in the cross-treated group.

3. Similar exposure of the guinea pig's hind limbs followed by re-exposure three weeks later to the same stimulus also resulted in anaphylactic shock. Cross experiments were again negative.

These experiments would indicate that the exposure of the organism to a physical stimulus leads to such chemical-structural changes in the protein of the plasma or cells sufficient to cause denaturation of the protein of the organism, making it in effect a foreign protein for the organism, which so acts as an antigen. This antigen developed in the organism itself by the physical stimulus might be called an "endo-antigen". This leads to production of antibodies. Then on the next exposure to the same physical stimulus the conditions for the formation of the same endo-antigen are again present. This corresponds to the reinjection of a foreign protein, just as the first exposure to the physical damage corresponded to the sensitizing injection, and consequently is followed by the combining of the immune bodies, cell injury, release of histamine, and local or systemic reaction characteristic of allergy.

The Ontario Neuro-Psychiatric Association

A meeting of the Ontario Neuro-Psychiatric Association was held at the Ontario Hospital, Toronto, on March 24, 1939. A Metrazol Round Table Conference was held prior to the general meeting, a report of which was afterwards read at the General Meeting.

The President, Dr. D. R. Fletcher, presided. After the Invocation, which was given by the Reverend John Bushell, and the Address of Welcome by Dr. J. R. Howitt, the following program was given.

Case report of a familial organic brain disease—Dr. W. A. Cardwell, Ontario Hospital, Whitby.

Case report of a psychosis with Froehlich's syndrome and head trauma—Dr. H. F. Frank, Ontario Hospital, Toronto.

Clinical presentations—by Dr. D. R. Gunn and Dr. W. W. Barraclough.

After the meeting the usual dinner followed, with Dr. D. R. Fletcher as evening speaker.

There will be a clinical meeting of the Association on May 5, 1939, in Toronto, and the Annual Meeting will be held on June 16, 1939, at the Ontario Hospital, Whitby.

A. MCCAUSLAND, *Secretary,*
Ontario Neuro-Psychiatric Association.

Post-Graduate Courses

Post-graduate Courses in Paris.—The Medical Faculty of the University of Paris, in collaboration with the Association pour le developpement des Relations Médicales and the American Medical Society of Paris, has organized courses in English for graduates in medicine. The cost of a course is generally six dollars per lesson, whether taken privately or in group, and is divided between the students. For example: 6 lessons: 36 dollars; if there are 6 students each one will pay 6 dollars for the entire course. Special arrangements can be made for courses exceeding a week.

Operations on the cadaver will be arranged on request. Courses in dissection may also be arranged. Apply to the A.D.R.M.

Free: All physicians may witness operations in the various clinics of Paris. Physicians may attend medical lectures in the hospitals, but to understand such lectures it is necessary to have a fair knowledge of French.

Lodgings may be provided at the Cité Universitaire, Boulevard Jourdan (Maison Américaine), or in the various French pensions.

The Faculty of Medicine will grant, for post-graduate work done here, a certificate to physicians who are graduates of a reputable medical college and who have taken courses during a period of no less than two months in Paris. These certificates will bear the Dean's signature.

For all information apply to the office of the Association pour le développement des Relations Médicales (A.D.R.M.), Salle Béclard, Faculté de Médecine, 12, rue de l'Ecole-de-Médecine, Paris.

Vancouver Medical Association

The Vancouver Medical Association is holding its Summer School in June this year, from the 6th to the 9th inclusive. The new Hotel Vancouver will be the centre where these lectures will be given, and various clinics will be given at the hospitals of the city.

The list of speakers is a guarantee that this school will come well up to the standard set by former schools. On the list we find the name of Dr. L. C. Conn, of the University of Alberta, well and most favourably known to us in British Columbia. Some two or three years ago he gave some lectures at the Annual Clinical Meeting of the British Columbia Medical Association and impressed us all by his teaching ability.

Stanford University contributes two speakers, Dr. Emil Holman in surgery, and Dr. Dwight L. Wilbur in medicine. Dr. C. P. Mathe, in urology, from the same city, and Dr. Frank R. Menne, from the University of Oregon, in Portland, are the other members of the team, Dr. Menne speaking on pathology.

University Notes

University of Toronto

The Charles Mickle Fellowship.—The University of Toronto announces the award of the Charles Mickle Fellowship for 1939 to Charles Herbert Best, M.A., M.D., D.Sc., F.R.S., Professor of Physiology in the University, for his contribution in certain branches of physiology, in particular, those related to diabetes and carbohydrate metabolism; to histamine and histaminase; to choline and fat-metabolism; and to thrombosis and heparin.

This Fellowship, bequeathed by the late Dr. W. J. Mickle, is the income from an endowment of $25,000, and is awarded annually to that member of the medical profession who is considered by the Council of the Faculty of Medicine to have done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science.

Letters, Notes and Queries

Health Insurance

To the Editor:

I am writing this letter to point out certain important inaccuracies concerning British Columbia in Dr. T. L. Fisher's article "Health Insurance and Associated Medical Services Incorporated" which appeared in your March number. The inaccuracies not only with respect to British Columbia but other parts of the world are so serious that I feel they must be pointed out. I do not think that these misstatements were deliberately made by Dr. Fisher or that they were deliberately passed over by the editor. In both cases the explanation is ignorance and it is with the intention only of stating the facts that I am writing.

First, "the abortive attempt made by British Columbia to foist a system of health insurance on the public". I make the statement deliberately that no social legislation in the history of the Dominion of Canada was more democratically prepared. Two public Commissions investigated the subject and both reported favourably. A Hearings Committee held public hearings on a draft bill in every important centre in the province. The draft bill was modified in line with recommendations made at these hearings. Subsequent to the holding up of the Act, a plebiscite was held on the question of health insurance (not on the Act) which resulted in a yes vote of 147,831 and a no vote of 103,633.

Answers to letters appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

Second, "The scheme was quite unsuitable because it included only certain wage groups who were able to pay usual medical fees without the insurance, and who, when included, would have received medical service at much less cost." Surely there is no excuse for such misrepresentation.

The Commission on Health Insurance which reported in 1921 recommended an upper income limit of $3,000 a year for insured persons. The Royal Commission which reported in 1932 recommended an income limit of $2,400. The report of the Hearings Committee, 1935, reads, ". . . some members of the Committee think that the $2,400 limit should stand, some that it should be increased, but all are in agreement that the limit should not be reduced below $1,800 a year. . . The major consideration of the Committee in suggesting that the limit of $2,400 be reduced to $1,800 is the desirability of obtaining the cooperation of the medical profession".

Dr. Fisher himself states in his article that an income of "$1,449 does not allow much serious illness, unless the family has some way of saving for it in advance, and it is for this large group of nominally self-supporting persons that health insurance is being considered".

The vast majority of all persons covered in the British Columbia Act were under the $1,500 limit, yet Dr. Fisher says that "It included *only* (italics mine) certain wage groups who were able to pay usual medical fees without insurance". Dr. Fisher's statement would be true only if health insurance covered those in receipt of incomes say from $2,400 up, accepting for the moment the assumption that everyone receiving $2,400 or more a year does not need health insurance. So the reader of the article reaches the fantastic conclusion that the Government of British Columbia attempted to foist on the public a system of health insurance which included only those already able to pay usual medical fees.

"Further the scheme did not include indigents or unemployed whom the doctors were expected to look after without remuneration, as in the past". No scheme of health insurance covers indigent persons. How can an indigent person pay premiums for insurance? The doctors of British Columbia were not expected to look after indigents without remuneration. British Columbia has paid out hundreds of thousands of dollars to the medical profession during the depression for services rendered those on relief. Again Dr. Fisher's statements are incorrect.

The whole subject of health insurance is, I realize, highly involved. This is all the more reason why accurate information is so important to the medical profession as well as to the public. Consequently when the *Canadian Medical Association Journal* publishes an article such as Dr. Fisher's it is serious when errors of fact, such as the following are made:

1. "In Germany voluntary health insurance was in existence from 1883 until the advent of Hitler in 1934, when it was made compulsory with everything else."

2. "Denmark's system began in 1892 and was made compulsory in 1923."

3. In Scotland the patients under health insurance have to pay for their medicines themselves.

In conclusion it is only fair to state that there are many good features in Dr. Fisher's article.

G. M. WEIR,
Provincial Secretary,
British Columbia.

March 15, 1939,
Victoria, B.C.

Health Insurance

To the Editor:

In the discussion of a subject as large as Health Insurance reference to other pertinent subjects must necessarily be short, even when such subjects themselves are of considerable magnitude. To mention them, with such opinions as can be formed about them from the facts at one's disposal, is all that can be done. My opinion about the British Columbia Health Insurance Act of 1936, as part of the larger subject of Health Insurance, was therefore stated as tersely as possible, with no more supporting evidence than seemed necessary. Without wishing to enter into any argument on a matter of opinion — whether the scheme of Health Insurance as it was proposed in British Columbia was suitable or unsuitable—the following from the 1936 Act will serve to show some of the reasons why, in my article, it was referred to as unsuitable:

1. Indigents were excluded. Old-age pensioners and widow pensioners were excluded.

2. Agricultural employees were excluded. Part I, 4. (2), (*a*). Domestic servants, casual employees, part-time employees could be excluded. Part I, 5. (*a*), (*b*), (*c*). That is, the people who were in greatest actual need of just such assistance either were or could be excluded.

3. Persons with incomes up to $1,800 were to be included.

4. Payments to doctors were to be "at a rate of not less than $4.50 per annum per insured person eligible to receive benefits." The most reliable figures available estimate that it costs close to $25.00 per year per individual to provide a complete medical service, the type of service the British Columbia Act was supposedly designed to supply. On this basis payments for physicians' services under the British Columbia Act would have been much lower than they are at present among uninsured. A fair inference would be either that the service would have to be curtailed in some way, or that the eligible persons in the higher income groups would receive medical attention at much less than the usual cost.

The other statements complained of by Hon. Mr. Weir may be corrected thus:

1. In Germany Health Insurance was in existence from 1883, was poorly enforced, and, therefore, in effect, voluntary from 1900 until the advent of Hitler in 1934.

2. Denmark's system began in 1892 and was made compulsory in 1933.

3. The statement as it appeared in the article, referring to Scotland, "because the patients have to pay for the medicines themselves. . ." would have been accurate had it read "because some of the patients. . ."

T. L. FISHER.

Ottawa,
April 12, 1939.

An Experiment in Health Insurance

To the Editor:

Just a line to say how much I liked the current *Journal*. In the first article you seem to have got hold of something new and valuable, but that is not in my line.

The article of T. L. Fisher is first rate;* not only informative, but very clear and well arranged. I am very interested in it because it deals with an experiment in Medical Insurance for those who are not usually regarded as needing it, though as a matter of fact they need it very much, and in my opinion it is very important that the profession should take the lead in such matters and not wait until they are kicked into it, as Fisher says.

There is only one point where I think he goes wrong. Dealing with the provision of medicine, he rightly says the costs of medicine as part of the medical care of the people, are twice as high (in England) as in Scotland. I think he has overstated the case, but there is no doubt that in National Health Insurance in Scotland (the only service for which there are any data) the cost of medicine is decidedly lower than in England and Wales. But the medicines insured persons require are *not* paid for by themselves but by the Fund. I think the explanation of the lower costs in Scotland is that for generations in most parts of Scotland the doctors have written prescriptions and the people paid the chemist, and thus the habit of regarding the advice as the main thing has grown up. The Scot, with his natural and laudable habit of despising waste, still continues to regard the medicine as not the essential thing, even though he can get it for nothing. And the doctor, long accustomed to prescribe with due regard to the purse of his patient, by force of habit still prescribes more economically than in England and Wales. Long may it continue.

I hope you will give us from time to time information as to how this interesting experiment progresses. It has my best wishes.

ALFRED COX.

March 21, 1939,
Tavistock House (South),
London, W.C.1.

* *Canad. M. Ass. J.*, 1939, **40**: 284.

Abstracts from Current Literature

Medicine

Hereditary Ectodermal Dysplasia of the Anhydrotic Type. Lord, L. W. and Wolfe, W. D.: *Arch. Derm. & Syphilol.*, 1938, **38**: 893.

These authors review the published cases of this disease, and, naturally, with such a designation include in it only those cases in which there is lack of sweat glands as well as defect in the hair and teeth. They report two new cases of a 6 year old boy and his 32 year old maternal uncle. The child had 6 peg-shaped teeth, 4 in the upper and 2 in the lower jaw; the hair was sparse and thin, and the child never perspired. Biopsy specimens of the skin from the forearm and axilla showed complete absence of sweat and sebaceous glands and hair-follicles. Administration of 5 minims of 1 per cent solution of pilocarpine hypodermically caused no perspiration, the child only felt uncomfortably warm, and there was temporary frequency of urination. A control child perspired profusely under the conditions of this test. The giving of 200 c.c. of milk warmed to 100° F. caused the rectal temperature to rise from 99.4 to 100.8° within ten minutes and to remain there for 90 minutes. A normal child perspired and showed no rise in temperature.

The uncle had but 4 teeth, worn down at the tips to resemble truncated cones; very sparse hair; and lack of sweat and sebaceous glands, also of hair follicles in a biopsy specimen of skin from the forearm. In summer he had to have his underclothing constantly moistened in order to be comfortable. The intelligence quotient of the child was 90; the mentality of the uncle was also below normal. MADGE THURLOW MACKLIN

Alterations of Liver in Erythroblastic Anæmia with Jaundice. Acuna, M. and Bonduel, A. A.: *Prensa Medica Argentina*, 1938, **25**: 2444.

The authors state that the liver becomes involved in the course of hæmolytic erythroblastic anæmia which results from the contact of the structure with hæmoglobin from hæmolysis. The lesion in the liver permits the passage of direct bilirubin to the blood with consequent development of jaundice with a clinical picture which is similar to that of hæmolytic jaundice (Minkousky-Chauffard's type). They made a clinical study and tests for the function of the liver in several children and adults who were suffer-

ing from erythroblastic anæmia and jaundice. They found that the patients had periodic exacerbations which were controlled by transfusion. The blood picture is that of intense anæmia and the presence of a large number of immature erythrocytes and leucocytes. Frequently the picture is that of Von Jaksch's pseudoleukæmia. The liver is enlarged. Biopsy of the liver shows various alterations of the structure, especially acute infiltration with pigments derived from hæmoglobin. The Kupffer cells of the liver are engorged with transformed hæmoglobin. Serial tests for the function of the liver showed insufficiency, which depends on the intensity and evolution of erythroblastic anæmia. It intensifies in the periods of deglobulization and improves during the periods of amelioration of anæmia. The elimination of hippuric acid is diminished, bilirubinæmia and galactosuria are increased and bilirubin in the urine is positive. Urobilinuria is increased during the period of deglobulization and in advanced phases of the disease. The authors therefore conclude that erythroblastic anæmia with jaundice and congenital splenomegalic hæmolytic jaundice (Minkousky - Chauffard's type) are two different clinical forms of congenital hæmolytic jaundice. S. R. TOWNSEND

Surgery

The Surgical Treatment of Obstructive Jaundice in Pancreatic Disease. Fraser, Sir J.: *Brit. J. Surg.*, 1938, **26**: 393.

This article is a summary of the result of findings in 1,035 cases of obstructive jaundice in relation to pancreatic disease.

Close observation and tests show conclusively that this condition, both simple and malignant, is more prevalent during the 50- to 60-year period, being more common in males than in females, in the proportion of two to one. So difficult is it to ascertain the true nature of the morbid anatomy, even at operation, that 7 per cent of the simple cases are mistaken for malignant disease, while 16 per cent of the malignant are classified as simple.

In diagnosing the malignant type of jaundice, the author suggests an immediate direct van den Bergh reaction as an unfailing test of the obstructive nature of the jaundice. A satisfactory conclusion of the pancreatic source of obstruction may be arrived at by: (*a*) the sequence of the case-history; (*b*) the nature of the pain; (*c*) the condition of the gall bladder. The barium-meal investigation is of little or no value, but the icteric index and serum-bilirubin readings are of considerable assistance in ascertaining the degree of the obstruction and determining the prognosis.

In estimating the extent, the site, and the nature of the pancreatic disease, examination of the fat-content of the stool is necessary. For instance, sugar-tolerance and blood-urea readings will show the effects of the obstruction on the liver and renal functions. Blood-coagulation readings do not offer a reliable source of information and the value is even quite doubtful.

Operating for obstructive jaundice arising from pancreatic disease has led to diversified opinions, but the majority speak in favour of surgery. There are several types of surgical procedures, but the internal drainage or anastomosis seem the more popular, while cholecystgastrostomy is the choice in 45 per cent of instances. The mortality figures for operation are: (*a*) all types of cases, 40.1 per cent; (*b*) malignant disease of the pancreas, 51.84 per cent; (*c*) chronic pancreatitis, 19.8 per cent.

Observation of the cases during the period following operation for malignant disease of the pancreas shows that 90 per cent die within the first year, but during life, the large percentage enjoy relief from pain, jaundice, and pruritus. A similar analysis in chronic pancreatitis shows that 60 per cent of cases are alive at varying periods exceeding one year after operation, and are enjoying comparatively good health. When relapses occur, they are likely to be associated with previous operations of the surface-drainage type. S. O. MCFETRIDGE

Purposeful Splinting following Injuries of the Hand. Kock, S. L. and Mason, M. L.: *Surg., Gyn. & Obst.*, 1939, **68**: 1.

Three important principles are involved in the use of splints for the injured and maimed hand: rest of the inflamed and injured soft and bony tissues, relaxation of muscles, tendons and nerves and constant and prolonged tension upon scar tissue whose gradual contraction interferes with the function of the hand. Rest in the position of function is obtainable by plaster of Paris moulded or casing, aluminum or "cock-up" in case of sprain, laceration, burn, infection or over-zealous active treatment. Relaxation of the lacerated, divided and sutured tendon, partially divided tendon, infected and sloughing wounds of the dorsum of the hand: in cases of divided flexor tendons most of the flexion should be obtained at the wrist and metacarpophalangeal joints. Relaxation of the muscles in divided nerve injury must be immediate and continued: particular attention must be given to the muscles of the thenar eminence, the lumbricals and interossei in all cases of median, ulnar and radial nerve injury.

The plaster of Paris moulded splint is the handiest for temporary use. For open wounds, tension and frequent removal and for long usage aluminum of 0.064 inches thick (designated No. 2 S ½ H) can readily be adapted to many cases. The author gives a detailed description of the manner of preparation of volar cock-up (position of function), extension of fingers and thumb, tension at metacarpophalangeal and interphalangeal or upon fingers and for tension on flexed fingers. FRANK DORRANCE

Obstetrics and Gynæcology

Administration of Pituitary Extract in the Third Stage of Labour. Blomfield, G. W.: *Brit. M. J.*, 1938, **2**: 1083.

A series of cases in which 1 c.c. (10 units) of pituitary extract was administered intramuscularly early in the third stage of labour was compared with a similar series of cases in which no oxytocic drug was given during that stage. The experiment aimed at ascertaining (1) the amount of blood loss post partum; (2) the length of time of the third stage; and (3) any untoward result or dangers which might result.

The results of this experiment are said to show: (*a*) that there is no danger whatever in giving 1 c.c. of pituitrin or pitocin during the third stage of labour; (*b*) that the amount of hæmorrhage is not much affected; in the series there was a tendency to a smaller post-partum loss in the pituitrin cases.

It is not claimed that posterior pituitary extract should be given in the third stage as a routine treatment for all cases, nor should control of the fundus or the very watchful care that is necessary at this stage be relaxed or replaced by an oxytocic drug. ROSS MITCHELL

Pelvic Hydatid Cysts and Obstructed Labour. Embrey, M. P.: *Brit. M. J.*, 1938, **2**: 1201.

Two cases of obstructed labour due to a hydatid cyst are described because of their comparative rarity. Both cases were examples of secondary echinococcosis with multiple cysts in the peritoneal cavity. In neither case was there a history of anaphylactic manifestations such as frequently accompany rupture of the primary cyst. Although hydatid disease had probably been present for several years it was not suspected. In the first case it was discovered at the fifth month of pregnancy and in the second during labour. ROSS MITCHELL

A Comparison of the End-results of Treatment of Endocervicitis by Electrophysical Methods; Cautery, Coagulation and Conization. Jacoby, A.: *Am. J. Obst. & Gyn.*, 1938, **36**: 656.

All three methods are satisfactory for removing the diseased cervical mucosa. The patients treated by cauterization are cured more quickly and with fewer complications than those treated by the other two methods. Nabothian cysts and cervical erosions are best treated by cauterization. The cautery is superior to the other two electrophysical methods for treating chronic cervical inflammations. ROSS MITCHELL

The Cæsarean Scar. Schwartz, O. H., Paddock, R. and Bortnick, A. R.: *Am. J. Obst. & Gyn.*, 1938, **36**: 962.

From a study of the series of uteri from pregnant rabbit it is concluded that the healing process is entirely similar to that in guinea pigs, that healing takes place chiefly by the proliferation of fibroblasts along the line of incision entering the spaces between the adjacent muscle bundles. As the scar shrinks this becomes less perceptible, and it is difficult to demonstrate the line of incision with ordinary hæmotoxylin-eosin stains after a two weeks' period. Van Gieson's stain brings out this differentiation. In uteri removed after previous Cæsarean section, the scar is frequently imperceptible, but in many cases increased connective tissue can be demonstrated. The reason that the scar is imperceptible is due to the marked shrinking of the newly developed connective tissue and the fact that it branches off in between the muscle bundles along the line of incision. Also, if the suturing has been well done the muscle edges are in close apposition, which necessitates only a comparatively narrow line of healing. As this shrinking takes place the normal relationship of smooth muscle and connective tissue, as it occurs in the normal pattern of the uninjured uterus, is similar.

ROSS MITCHELL

Pædiatrics

Prophylactic use of Parenteral Blood Serum against Contagion in a Pædiatric Ward. Barenberg, L. H., Greene, D. and Grand, M. J. H.: *Am. J. Dis. of Children*, 1939, **57**: 322.

Outbreaks of contagious diseases in children's hospitals constitute a grave menace to the health of patients, and the economic loss from the repeated quarantine periods greatly increases the cost of hospital pædiatric care. The authors describe their efforts to reduce this menace by routine intramuscular injections of parental blood serum to every child admitted to the medical pædiatric ward. The surgical ward patients served as a control group. Sixty to 70 c.c. of whole parental blood provide the required 20 c.c. of serum which is injected into the child usually within twelve hours of admission. The Kahn reactions of all bloods are checked and the positive sera discarded. These children receive Kahn-negative sera from stock. In no instance was marked discomfort, infection, necrosis, abscess, or reaction noted, in many thousands of injections. In the seven-year period of observation there were 2,484 admissions to the medical and 3,115 admissions to the surgical ward. In the first three and a half years the ordinary methods of prophylaxis were practised, and in the second three and a half years the same measures were employed and the parental sera given. During the first period thirteen outbreaks of contagion occurred in the medical and thirteen in the surgical. In the second period no outbreaks occurred in the medical, whereas twelve occurred in the surgical. It is pointed out that during the second period the same opportunity for exposure and contact existed as had been the case previously, and the

incidence of infection in the community had not altered significantly. It is concluded that the routine use of blood serum affords an efficient prophylaxis against measles, diphtheria, and scarlet fever in an active pædiatric ward.

REGINALD A. WILSON

Sulphanilamide Eruption. Schlesinger, E. R. and Mitchell, W. L.: *Am. J. Dis. of Children,* 1938, **56**: 1256.

The details of 10 cases of sulphanilamide eruption are reported with a view to studying the nature of the eruption and the associated leucocytic response during the rash. The eruption appears within 3 to 17 days of initial dosage with sulphanilamide. It is occasionally preceded by transient leucopenia. In all cases there was a prodromal period of fever of about 72 hours' duration which continued until the appearance of the eruption. The rash is usually morbilliform and lasts 36 to 96 hours. In 4 cases leucopenia developed as the rash was fading. After varying intervals re-administration of the drug caused a totally different reaction. A single large dose resulted in a sharp febrile response within a few hours and in a leucocytosis often associated with malaise, nausea, vomiting, headache, and drowsiness, and nearly always accompanied by a brilliant scarlatiniform eruption continued administration produced purpuric manifestations. A parallel is drawn between the present reaction and nirvanol sickness.

REGINALD A. WILSON

Urology

Treatment of Neurogenic Diseases of the Bladder. Herbst, W. P.: *J. Urol.,* 1938, **40**: 789.

The treatment of neurogenic diseases of the bladder is one of the most indefinite, and, in some instances, most unsatisfactory problems with which the urologist has to deal. The various procedures concerned with neurogenic and painful conditions of the bladder are not classified to such an extent that we can determine what particular procedure is to prove successful. The investigation of pain with bladder dysfunction should be carried out in great detail. Many of the contributions along the lines of cystometric tracings merely serve to warn the average urologist of the necessity of a reliable neurological examination. The more common types of neurogenic dysfunctions of the bladder occur in (1) tabes; (2) temporary paralysis incident to surgical trauma; (3) painful contraction of the bladder wall; (4) spasm of the vesico-ureteral junction; (5) brain and spinal cord tumours, etc. The treatments of such dysfunctions depend primarily upon the localization of the lesion. For tabetic bladders the author has found the acetyl-choline derivatives useful, and in some instances where these fail ergotamin has been found effective. The Morse wave treatment has been found effective in both tabetic bladders and paralytic conditions incident to surgical trauma. In the group of cases with hyperdynamic bladder musculatures the ordinary sedatives will sometimes offer relief. Other preparations such as syntropan, eserin, whole pituitary atropin derivatives are necessary. A conservative attitude should be maintained and simple measures employed before resorting to ureteral neurectomy, presacral neurectomy, and sacral ganglia resection.

J. VICTOR BERRY

The Use of Neoprontosil in Infections of the Urinary Tract. Cook, E. N.: *Proc. Staff Meet. of Mayo Clinic,* 1939, **14**: 39.

The author reports the results obtained with neoprontosil in 100 patients who had infections of the urinary tract and were seen in the Section of Urology at the Mayo Clinic. As with mandelic acid and sulphanilamide, neoprontosil is most efficacious when it is used in the uncomplicated cases of infections of the urinary tract caused by the Gram-negative bacilli, the beta-hæmolytic streptococci, or some of the micrococci. In complicating lesions, such as stone, tumour, deformity in the pelvis or calyces of the kidneys the action of neoprontosil and sterilization of the urine will be more difficult. In the series of cases the author is of the opinion that the efficacy of neoprontosil in eradicating infections of the urinary tract closely approximates that of sulphanilamide. A slightly increased dose is indicated, and a more prolonged period of medication is sometimes necessary. In Cook's experience the drug is of lower toxicity than sulphanilamide when used in comparable cases. "Its use for acutely ill patients and for those to whom it is necessary to give some medication over a long period because of certain chronic ailments has been of great value."

J. VICTOR BERRY

Ophthalmology

Contribution to the Study of the Genesis of Detachment of the Retina. Redslob, E.: *Ann. d'Ocul.,* 1938, **175**: 637.

The vogue for studies on detachment of the retina seems to have abated somewhat. In the last ten years more than 600 articles on this subject have appeared. Have they cleared up all the questions connected with this subject? It seems to the author that though we may have arrived at a satisfactory therapeutic technique the question of origin is still much to the fore.

The important rôle attributed to the closing of the tear is known to all ophthalmologists, but when discussing whether the tear is the principal etiological factor in the development of the detachment one meets different opinions. Unquestionably there are cases of detachment where, despite the most minute examination with the ophthalmoscope and microscope, no sign of a tear is to be found. Such a case of detachment relatively fresh, where histological examination

allowed us to eliminate all possibility of perforation of the retina, was published by the writer a few years ago. We may conclude that the mechanism of detachment of the retina is still imperfectly known, and it seems useful to bring together all possible facts in order to arrive at a better understanding of the problem. The author gives in detail the histological examination of an enucleated globe, with two illustrations. S. HANFORD MCKEE

Appearance of the Fundus of the Eye in Intracranial Tumours. A Statistical Study. Hartmann, E. and Guillaumat, L.: *Ann. d'Ocul.*, 1938, **175**: 717.

Ophthalmoscopic alterations in the course of the development of intracranial tumours give rise to various problems particularly dealing with lesions of the fundus of the eye. It is not the purpose of this paper to enlarge upon the appearances found, but, rather, to establish the frequency of lesions in the different varieties of cerebral tumours.

The statistics are made up from the study of 1,169 cases, so that the percentages calculated should be of real significance. The diagnosis was verified by operation or autopsy. In the first part the lesions are classified according to their nature, in the second, according to their site, and in a third in different clinical groupings. Gliomas give a larger percentage of disc stasis (76 per cent) than the meningiomas (40 per cent). This corroborates the teaching of the Lyonnaise school. Tumours of the posterior fossa give a large percentage of disc stasis (71 per cent). Anterior tumours give a substantial percentage of disc stasis (meningiomas frontal, 33 per cent; frontal tumours other than meningiomas, 58 per cent; combined 53 per cent). The frequency of disc stasis in encephalitis is quite high, 50 per cent. The article contains numerous tables of percentages.

S. HANFORD MCKEE

Sulphanilamide in Gonorrhœal Ophthalmia. Fernandez, L. J. and Fernandez, R.: *Am. J. Ophth.*, 1938, **21**: 763.

This paper is a report on the treatment of 14 cases in all of which useful vision in the affected eye was retained, 8 of them healing without corneal complications. All patients who received sulphanilamide recovered in a spectacular manner and in a shorter period of time than that required by other accepted forms of treatment. Cases of primary eye infection where no pre-existing focus of gonorrhœal infection could be demonstrated responded as well as those of secondary eye infection. Three cases of primary infection failed to respond to any other type of treatment hitherto employed. The results obtained in this series warrants the judicious use of sulphanilamide in all cases of gonorrhœal ophthalmia, whenever there is no serious contraindication. The mode of action of the drug needs more thorough investigation. The authors only checked their clinical findings by routine laboratory examination, but suggest it is necessary to determine the minimal effective dose. Smaller doses and special precautions must be used for patients with renal insufficiency, because the excretion of sulphanilamide is slow and in such patients would aid accumulation of the drug in the blood. S. HANFORD MCKEE

Neurology and Psychiatry

Relapsing Juvenile Chronic Subdural Hæmatoma. Davidoff, L. M. and Dyke, C. G.: *Bull. Neurol. Inst.*, 1938, **7**: 95.

Herein are reported 4 patients who suffered from a head injury and resultant subdural hæmatoma in early childhood. This condition remained undiagnosed until a second accident, five to eleven years later, resulted in a recurrence of symptoms. The authors believe that these cases are examples of a hitherto unrecognized clinical entity. The significance of the original injury in such a patient may be overlooked unless the relapsing character of the hæmatoma is made evident by recognition of the typical roentgenological picture. The patients give a history of cranial trauma five to eleven years before observation and of a second trauma within two to twelve months of admission. There may or may not be any symptoms referable to the head in the intervening years. Changes seen in the roentgenograms on the homolateral side of the skull, in varying degrees, consist of: (1) elevation of the sphenoid ridge, superior orbital plate and superior orbital ridge; (2) deepening, widening and lengthening of the middle fossa; (3) atrophy of the inferior and lateral wall of the superior orbital fissure; (4) hypertrophy of the frontal and ethmoidal sinuses; (5) thickening of the skull. The ventriculograms show slight to moderate displacement of the ventricular system contralateral to the side of the lesion, with no ventricular enlargement and only slight asymmetry. The treatment is the same as for the classical subdural hæmatoma and the results are just as satisfactory. FRANK TURNBULL

The Cutaneous Histamine Reaction as a Test of Peripheral Nerve Function. Laeser, L. H.: *J. Am. M. Ass.*, 1938, **110**: 2136.

The work of Sir Thomas Lewis has shown that the cutaneous injection of histamine possesses certain definite characteristics. A wheal develops immediately surrounding the site of injection, a pure irritant response quite independent of the nerve supply. About this wheal appears an area of arterial dilatation, the "flare". This latter phenomenon is directly dependent on the integrity of the peripheral sensory nerves. Section of the nerve anywhere from ganglion to skin abolishes the response. Since, excluding cranial nerves, the peripheral nerves contain both motor and sensory fibres the

status of that peripheral nerve may be estimated by determining the condition of the sensory fibres. Intradermal injection of 0.01 c.c. of 1/1,000 histamine is suggested, the injections being made 1 to 3 inches apart along the area to be tested. The reactions are graded from 0 to 4 plus according to the intensity of the flare. This flare reaches its maximum intensity in 3 to 5 minutes and begins to fade in 7 to 10 minutes. Variations from normal may include delay or decrease in extent or time of reaction. These may be caused by (*a*) partial degeneration of peripheral nerve; (*b*) poor vascular supply, and (*c*) faulty technique.

The author has found the test of value along the following lines: (1) to determine the presence of degeneration and later regeneration in traumatic nerve injury. In the writer's experience the absence of flare antedates the electrical changes, and, conversely, flare returns before the reaction of degeneration shows any alteration; (2) to differentiate organic anæsthesia from the changes, often puzzling, found in hysteria and malingering; (3) as an aid in localizing spinal cord lesions. If two or more ganglia are involved a segmental area at the upper level of the lesion will give a negative response to histamine; (4) to differentiate spinal cord lesions, where flare response is unaffected, from extra medullary lesions where there is definite change in cutaneous reaction.

G. N. PATERSON-SMYTH

Therapeutics

The Treatment of Gonorrhœal Urethritis in the Male (in particular with M & B 693) in Patients not Receiving Local Treatment. Durel, P.: *Presse Méd.*, 1938, **46**: 1571.

The author recalls that he was the first to publish the results of treatment of gonorrhœa in Europe with sulphanilamide and that his results were good. It seemed desirable, however, to essay a drug which was better tolerated in active doses and which would eliminate the necessity for local lavage. M & B 693 was given in doses of 3 grams daily for three days, 2 grams daily for the next three, and 1 gram daily for the final three days. The results in 73 cases of acute gonorrhœa in the male showed cure in over 80 per cent without the aid of local lavage. In chronic urethritis the percentage is about 70. In gonorrhœal cervicitis the results are incomplete but appear to be better than with sulphanilamide or rodilone. The toxic symptoms are rare and less marked than with sulphanilamide.

ARNOLD BRANCH

Lymphogranuloma Venereum: Especially its Treatment with Sulphanilamide. Shaffer, L. W. and Arnold, E.: *Arch. Derm. & Syph.*, 1938, **38**: 705.

This is a report on 46 cases of lymphogranuloma venereum in negresses. In twelve the diagnosis is open to doubt as the Frei test was positive only with mouse brain antigen, which the authors have found to produce questionable reactions. In their opinion the disease is spreading in temperate climates. Syphilis complicated the picture in 41 per cent of the cases. Previous methods of treatment in their hands have not been satisfactory. Twenty-two cases were treated with sulphanilamide in 10 of which other methods of treatment had failed. The oral doses were 40 grains daily for a week, 30 grains daily the following week, and 20 grains daily for the remainder of the treatment, which was carried on for one or two months. The results even with these small doses the authors think justify the employment of sulphanilamide in a larger series. Of their 22 cases, including both the acute and chronic, 4 made a complete recovery, 11 showed marked improvement, 4 defaulted, and 3 were failures. The optimum scale of dosage and length of treatment need to be worked out.

ARNOLD BRANCH

Pathology and Experimental Medicine

The Dynamics of Hypertension. Wiggers, C. J.: *Am. Heart J.*, 1938, **16**: 515.

This paper is a comprehensive analysis of the present knowledge of the dynamics of hypertension. Study of all available data indicates that essential and renal hypertension are basically due to unknown humoral agents, but vasoconstriction of nervous origin may be superimposed periodically or permanently. The need for further animal experimentation is stressed. The concepts of "central", "collective", and "effective peripheral" resistances are analyzed, and formulas for mathematical calculation of the latter are given. Peripheral effective resistance is increased in various forms of hypertension but the magnitude of the increase does not necessarily correspond to the degree to which the mean blood pressure is elevated, suggesting that other mechanisms are concerned.

All experimental evidence leads to the conclusion that intensive narrowing of small vessels in the splanchnic area must occur in order to produce elevations of pressure equal to those found in hypertension. There is no available proof that constriction of limb vessels contributes essentially to even a moderate hypertension. Organic lesions are often limited to a few organs—the kidney, spleen, pancreas, liver, brain and retina being involved, in order of frequency and severity. The view that functional contraction of arterioles and pre-arterioles occurs is plausible but there is no direct evidence to prove this. The possibility of some of the resistance occurring in vessels larger than pre-arterioles is mentioned.

Diminished elasticity of the aorta and its immediate branches increases the elevation of systolic pressure, reduces the diastolic pressure.

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and also accounts for the large pulse pressure and the rapid diastolic decline of subclavian pulses in hypertension. It is suggested that the division of cases of human hypertension into systolic and diastolic types does not serve any useful purpose and that the absence of a significant increase in diastolic pressure, far from denoting inconsequential involvement of peripheral vessels, is probably more often a sign of an extension of vascular changes to the larger vessels. The hypothesis is suggested that the agent or agents that are concerned in the production of experimental and human hypertension tend to act along the entire arterial tree, causing contraction of the muscular elements. In the peripheral vessels this narrows the lumen and increases peripheral resistance; in the aorta and distributing branches it reduces capacity and extensibility.

The effects of hypertension upon the dynamics of the left ventricle are determined chiefly by the increased load. The output tends to increase, the mechanical efficiency is increased, and the economy with which the mechanical energy is utilized to propel blood is decidedly increased. To do this the ventricle operates continually in the region of cardiac reserve, which explains the limited capacity for exercise and the development of the "effort syndrome" on exertion.

Recent experiments indicate that coronary flow increases as the systolic pressure and that mechanical adaptations between peripheral coronary resistance and aortic pressure, rather than nervous reflexes or chemical action, are chiefly concerned. W. H. HATFIELD

Hygiene and Public Health

Incidence of Tuberculosis in Young Adult Women, with Special Reference to Employment. Heimbeck, J.: *Brit. J. of Tuberc.*, 1938, 32: 154.

In studying a group of young women from the middle classes in Oslo (from which nurses are recruited), the author found in 1924 that at age 15 only about one-third reacted positively to the Von Pirquet test, and at age 20 less than one-half were positive. Among the working classes in Oslo, however, he found that 45 per cent of 12 year olds were Pirquet-positive, 84 per cent at 21 years, and nearly 100 per cent at ages over 30 years. Figures are quoted from England and America which indicate that the Oslo experience in this connection is fairly typical.

In order to compare the experience of nurses with the general population he first of all examined 1,458 women between 13 and 24 years of age taken from the general population; 467 of these were Pirquet-positive and 991 negative. The positive and negative cases were followed for an average of four years each, during which time it was found that 14 of the positives contracted actual disease (with one death) while 52 of the negatives contracted the disease (with 3 deaths). There was, therefore, a higher incidence of disease per 1,000 persons among the Pirquet-negatives than among the positives. Further, it was calculated that only about one-quarter of the Pirquet-negatives became positive during the period under observation. This implies a very much increased incidence of actual disease among those who receive a primary infection comparatively late than among those who receive it early.

In another group of 682 women, aged 20 to 30 years, an even more marked morbidity and mortality was found among those who first were Pirquet-negative. The actual calculated morbidity rates per 1,000 years of exposure were 4.4 for the Pirquet-positives and 23.0 for the negatives.

Finally, a group of nurses in the Municipal Hospital at Oslo was studied. The Oslo Hospital is a general hospital of 2,600 beds; approximately 400 patients have tuberculosis, and many of them are open cases, so there is abundant opportunity for the nurses in training to come in contact with open lesions. During the years 1924 to 1936 1,453 probationers entered the training school; 45.3 per cent of them were Pirquet-positive. A study of these girls through their training and subsequently shows a constantly higher morbidity from tuberculosis among the Pirquet-negatives than among the positives. For example, 109 probationers started training in 1924, of whom 58 were Pirquet-positive and 51 negative. In the 14 years of observation since 1924 18 cases of tuberculosis have occurred among the 58 negatives (with 7 deaths) and only one case among the 51 positives. The experience of the other classes is similar. In total 34 cases of tuberculosis have been detected among the positives and 104 among the negatives, of whom 13 have died from tuberculosis. FRANK G. PEDLEY

Obituaries

Col. William Belfry Hendry, D.S.O., V.D., M.B., F.R.C.S.(C.), F.C.O.G., of Toronto, died on March 24, 1939. He was born in 1874 and graduated from the University of Toronto (1904). He was Emeritus Professor of Obstetrics and Gynæcology at the University of Toronto. Commander of No. 4 Canadian General Hospital unit from 1917 to 1928, Col. Hendry was twice mentioned in despatches during the war and was awarded the Distinguished Service Order.

He is survived by a widow and one son, Dr. George A. Hendry.

AN APPRECIATION

The death of Dr. W. B. Hendry is a distinct loss not only to the profession of Canada but also to a host of friends, than whom few men had more. The former can be remedied because in the capacity of professional attainments his place can, no doubt, be taken by others, but the latter is irreparable since none can fill the blank in the hearts of his friends.

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For "Bill" Hendry had an amazing capacity for friendship. Throughout his undergraduate days, in the period of his military service, and during his more responsible life as a member of the faculty he constantly made new friends and never relinquished the old ones. Only the highest type of character could be so much to so many. His inherent honesty, unwavering loyalty, and sound judgment aroused the admiration and respect of every one who came within the circle of his acquaintance. He was never cast down by failure or unduly elated by success, merely adopting the philosophic principle of doing well each day that which ought to be done, of never lamenting the past or fearing the future. In each field of activity his achievements were the result of straightforward endeavour and inherent merit. Being no sycophant catering to rich or influential, he was headstrong in the right, above artifice, and scorned even the suggestion of hypocrisy.

But through this stream of sterner qualities there sparkled a subtle sense of humour. He could always see the brighter side of life, by which vision he made excuses for men's frailties and forgave their shortcomings. The foibles of his associates were to him a study in psychology and frequently a source of inspiring merriment. He would listen to opinions graciously, weigh them carefully, if worthy, accept them with praise, if not, reject them with a smile. As a student, as a sportsman, as a soldier and as a teacher he was a grand fellow.

"His life was an inspiration and his memory a benediction." FREDERIC BRODIE

Dr. George Washington Clendenan, of Toronto, died on March 20, 1939, aged seventy-eight. He was born in 1861 and a graduate of Victoria University, Cobourg (1882). He was formerly coroner for nearly half a century and, one time, mayor of Toronto Junction.

Dr. Clare Pattee Conroy, of North Bay, Ont., died on June 26, 1938. He was formerly of Santa Monica, California, and a McGill University graduate (1888).

Dr. John Henry Downing, of Toronto, died on March 10, 1939. He was born in England, 1869, coming to Canada in 1881, and a graduate of the University of Western Ontario (1903). Dr. Downing was Chairman of the Toronto Board of Education for 1938.

Dr. Thomas Arthur Ellis, of Toronto, died on March 21, 1939, in his sixty-first year. He was a graduate of the University of Toronto (1920).

Dr. James Johnston Fraser, D.S.O., M.D., D.P.H., of Hamilton, Ont., died on March 30, 1939. He was born in 1876 and a graduate of the University of Toronto (1902).

Dr. Roland Wilton Halladay, of Toronto, died on March 22, 1939, aged fifty-seven. He was born in 1881 and a graduate of Queen's University (1905). For nearly a decade he practised in Alberta, and at the outbreak of the War in 1914 joined the R.A.M.C. At the close of the War, Dr. Halladay took up residence in Toronto.

Dr. Norman McCormack, of Renfrew, Ont., died on April 11, 1939, aged seventy-eight. He was dean of the medical profession in Renfrew County and a former mayor of the town. He was a native of Fort William, and a graduate of McGill University (1885).

Dr. Donald McLennan, of Plattsville, Ont., died on March 26, 1939. He was born in 1862 and a graduate of McGill University (1888).

Dr. Everett Rexford Myles, of Windsor, Ont., died on February 26, 1939, aged forty-nine. He was born in Rochester Township and a physician at Windsor for fourteen years. He was a graduate of the University of Toronto (1924).

Dr. James Samuel Risien Russell, of London, Eng., died on March 20, 1939. He was a consulting physician to the National Hospital for Diseases of the Nervous System and a noted authority on his specialty.

Dr. Russell was an Honorary Member of the Canadian Medical Association.

Dr. George Watson Whitman died at his home in Stellarton, N.S., on April 5, 1939, after a long illness. He was born in Guysborough 61 years ago, and graduated from Dalhousie University in 1903, and after spending some years in Shubenacadie, took up his practice in Stellarton twenty-seven years ago.

A diligent and faithful practitioner, Dr. Whitman had interests, too, beyond those of his profession, serving for some years as mayor of Stellarton and showing a keen sense of responsibility in the welfare of the community. During the Great War he served overseas with the Royal Army Medical Corps, holding the rank of major. He was a member of the staff of the Aberdeen Hospital.

News Items

Alberta

The chiropractors have had an amendment to their Act. There are certain of them who have apparently defied the Chiropractic Association, and the former Act did not seem able to take them to task.

The Chiropodist Act is undergoing similar amendments, indicating that the cults as soon as they get an Act are very desirous that others may not readily acquire the privileges they have attained.

In some districts hairdressers are attempting to treat scalp ailments at so much per electrical treatment without knowing what they are doing. Recently they had a Bill before the Legislature, which, had it passed, would have given them certain privileges under which they could apply quartz light and electric machines for beauty purposes, really using therapeutic measures.

The Bill stated that "hairdresser" means and includes any person who with hands or by the use of any mechanical application or appliance or by the use of cosmetic preparations, antiseptics, tonics, lotions, creams, or similar preparations or compounds, engages in any one or more or any combination of the following practices, to wit manicuring the nails, massaging, cleansing, or beautifying the scalp, face, neck, arms, or busts of any person, and "hairdressing" has a corresponding meaning. The Legislature did not pass the Bill.

People on relief, or expecting to go on relief, have in many cases removed to districts where the relief allowance was greater than where they had been living, with the result that disputes as to responsibility were frequent, and hospitals and physicians were left "holding the bag". To clarify this the Municipal District Act has been amended as follows:

Any person who on the date of application for the placing of such person in a hospital has then had his home, or resided within the area controlled by a local authority for twelve consecutive months out of the twenty-four consecutive months immediately preceding the making of such application, and has not during such period of twelve months received any relief, shall be deemed to be a resident of the area controlled by the local authority within whose boundaries he has so resided. Residence once established in any municipal district remains therein

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established until such times as it has been established elsewhere. Any person, who, though being a resident of the province, has been a sojourner can qualify for hospitalization by being three months resident of one municipality in twenty-four months, being self-supporting for that three months.

The Bill introduced by the Dental Association, which changed the name to the "College of Dental Surgeons", consolidated the Dental Association Act, and provided for registering the dental mechanics and limiting their operations, was not passed in the late sessions of the Legislature.

Provision was made in the estimates of the Provincial Treasurer to permit the Department of Health to increase the number of district nurses by fifteen. The Government is to pay the salaries, the district is to supply the residence, and the family of the patient is to provide transportation, the nurse collecting where possible, remitting to the department the amount collected.

The Provincial Travelling Clinic will this year cover a territory in which there are no physicians, and will thus be doing what was originally planned it should do. For several years, owing to pressure from certain organizations, this clinic went to places where resident physicians could meet the need, but not so this year. Owing to crop conditions and prices many districts have been unable to pay for medical services, and physicians have been obliged to seek places where a living revenue was possible, thus there is need of the travelling clinic.

The Calgary Birth Control Society requested the City Council to make them a grant to provide a trained worker to educate the women on the matter of birth control. The City Council however did not accept the proposition, but voted to assign to the Health Department a private nurse or other qualified worker to disseminate birth-control information.

The University of Alberta, together with the Provincial Medical Association, has arranged for a refresher course at the University Hospital May 15 to 19, 1939, inclusive. These courses are becoming increasingly popular and are being furnished without registration fee or other expense. The lecturers are giving their services free and their work is highly appreciated.

Physicians from certain European countries are seeking Alberta registration, but until a general Canadian system of dealing with this matter has been definitely decided, one province cannot readily establish a precedent. These men express willingness to go to outside points now vacant, but, once registered, will not remain where they cannot make a living and will crowd centres already medically congested.

G. E. LEARMONTH

British Columbia

In the death of Dr. Gustaaf Adolf Ootmar at Okanagan Mission, British Columbia has lost a most valued citizen. Dr. Ootmar was not a native of this country, having been born in Haarlem, Holland, but, coming here in 1922, he speedily became the best sort of citizen, the man who makes the place where he happens to be his country, and proceeds to give himself and all he has to its service.

Dr. Ootmar came here for his health, as he suffered from "sleeping sickness", or its sequelæ. As soon as he recovered from the effects of this, he began to work, and offered to equip a room in the Kelowna Hospital for bacteriology and pathology, "just to keep up his interest" in these subjects.

The medical men and hospital embraced this offer eagerly, and in a few years Dr. Ootmar had built up this service to such a high level of excellence that the Provincial Board of Health, under Dr. H. E. Young, who never misses anything of this kind, decided to form a health unit in South Okanagan, and put Dr. Ootmar in charge. A qualified technician, an assistant, nurses, and so on, were added, and most valuable work has been done in this community as a result. Typhoid, which was formerly very prevalent in the Okanagan, diphtheria, infantile paralysis, have all been reduced to vanishing point by the work of this group under Dr. Ootmar; well-baby clinics have been inaugurated, and altogether this most welcome guest of our country has given in return for the hospitality he received acknowledgment far beyond anything he ever owed.

He was a doctor of medicine all his active life. He had many honours, was honoured by royalty, was a writer of note, and all his life he served others. He was a most worthy member of the great profession which he adorned.

The British Columbia Medical Association, under the energetic leadership of Dr. D. E. H. Cleveland, is doing very active work along several important lines. For example, the Committee on Maternal Welfare, under the chairmanship of Dr. C. T. Hilton, of Port Alberni, is at present studying the work of the Public Health Nurse with regard to pre-natal work; the Committee on Hospital Service, with Dr. Walter S. Turnbull, the Committee on Pharmacy, under Dr. Charles Vrooman, are also doing excellent work. Scientific Sections in Pædiatrics, and in Eye, Ear, Nose and Throat, are in process of formation.

The Committee on Economics of the College of Physicians and Surgeons, under the chairmanship of Dr. Cameron H. McEwen, is making an intensive study of lodge practice, amongst other forms of contract work. A questionnaire has been sent out to all men in the province, and the response has been good. This Committee is to be congratulated on the enthusiasm and energy they have displayed. It is a very important Committee, and, more and more, various questions of medical economics, voluntary insurance schemes, etc., are being referred to it, and are receiving attention and study.

J. H. MACDERMOT

Manitoba

A Sectional Meeting of the American College of Surgeons was held at Winnipeg, March 29th, 30th, 31st. Minnesota, North and South Dakota, Alberta, Saskatchewan, Manitoba, Western Ontario were represented. Total registrations were 699. The visiting speakers included Drs. Howard C. Naffziger, San Francisco, President of the American College of Surgeons; George Crile, Cleveland, Chairman of the Board of Regents; C. B. Puestow, Chicago; H. K. Gray, Rochester, Minn.; Wm. J. Engel, Cleveland; J. T. Priestley, Rochester, Minn.; E. R. Myers, Saskatoon; S. W. Harrington, Rochester, Minn.; H. Meltzer, Ninette, Man.; L. C. Conn, Edmonton; F. E. Adair, New York; D. S. Macnab, Calgary; H. H. Hepburn, Edmonton; F. L. Lederer, Chicago; F. H. Kreuscher, Chicago; A. L. Cameron, Minot, N.D.; R. D. Campbell, Grand Forks; M. T. MacEachern, Chicago; M. N. Newquist, Chicago. Clinics were held at the Winnipeg General Hospital, St. Boniface Hospital, Children's Hospital and St. Boniface Sanatorium. The panel discussions and clinical assemblies were held in the Fort Garry Hotel. There was also a well attended hospital conference.

On the evening of March 31st a public meeting on Health Conservation was held in Grace Church with an overflow meeting in Knox Church with an aggregate attendance of over 3,500. Dr. John A. Gunn, Chairman of the Local Committee on Arrangements,

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"LOWER AND NICHOLS [*Roentgenographic Studies of the Urinary System*] state that perhaps in no other field of medicine and surgery has the roentgenogram been of more signal value than in diagnosis of disease of the urinary tract but that nevertheless it is absolutely essential for the clinical diagnosis and the roentgen examination to be considered together in any given case." —*J. A. M. A., 106:* 602, February 22, 1936.

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presided in Grace Church and Dr. G. S. Fahrni, Secretary, at Knox Church. Mayor John Queen gave a brief address of welcome. ROSS MITCHELL

New Brunswick

Dr. H. L. Mellish, who previously practised in Hunter River, P.E.I., has now located in Havelock, N.B.

The quarterly meeting of the Council of Physicians and Surgeons of New Brunswick was held in Saint John at the office of the Registrar, Dr. J. M. Barry. Some discussion *re* the necessary action concerning refugee physicians resulted in confirmation of the Council's previous action, namely, that all students registering in the Province of New Brunswick must be of British birth. As this was the annual meeting, election of officers for the new year resulted as follows: *President*, Dr. R. G. Duncan, of Bathurst; *Registrar*, Dr. J. M. Barry. Hon. Dr. P. H. Laporte, Minister of Health and Labour, was named as representative of the Council to the Medical Council of Canada to complete the term of office of the late Dr. G. Clowes Van Wart.

During the present session of the provincial legislature, Hon. Dr. P. H. Laporte, Minister of Health and Labour, intimated that some new plan for the treatment of chronic tuberculosis cases, not in need of active hospitalization, would probably be worked out in the near future in New Brunswick. Dr. Laporte suggested that the burden of the care of the tuberculous patient should be cared for outside of the municipality and expressed the hope this would be accepted as a national problem.

Dr. Laporte also, in an address to the provincial legislature, stressed the many activities previously reported at the Provincial Hospital for the Insane, specifically mentioning the use of insulin shock which was perhaps first used in Canada in the New Brunswick institution. The inauguration of a mental hygiene survey to cover the province has been under consideration for some time. This would be closely linked with the Provincial Hospital.

Dr. William Warwick, chief M.H.O. for the Province of New Brunswick reported recently that New Brunswick had suffered from "one of those periodic high waves of diphtheria" in 1938. The death rate has jumped from 4.1 per 100,000 persons to a tentative 7.0. The greater number of victims had been among those residing in portions of the province where the percentage of immunized children was the lowest. Dr. Warwick suggested that legislation be provided whereby the public health authorities may be given greater authority in dealing with municipalities delinquent in furnishing safe water supplies.

Deaths from tuberculosis in New Brunswick receded in 1938 from 88.1 per 100,000 persons to a tentative figure of 72. Only once since 1920 has the death rate from tuberculosis been lower. During the year the Department of Public Health carried out a tuberculosis survey among the Indians in the western half of the province, 637 Indians were examined and x-rayed; 46 active cases of tuberculosis were found in this number and placed under treatment.

A. S. KIRKLAND

Nova Scotia

The Department of Public Health, under the ministry of the Hon. Dr. F. R. Davis, shows proposed expenditures for the coming year of $2,478,833, according to the report tabled in the provincial legislature. This is an estimated increase of approximately 125 thousand dollars over the previous year. Increase in the cost of operation of the Kentville Sanatorium, due to the opening of a new pavilion; the maintenance of a health unit in Cape Breton, operating this year for its first full year; greater call for mothers' allowances and old age pensions; increased disbursements to the local hospitals; these factors played leading rôles in the increased sum. The question was raised over the advisability of payments to local hospitals over which the province has no direct control. In the past ten years these amounts have increased by more than 100 per cent, and now total in the vicinity of 150 thousand dollars.

Most encouraging amongst public health reports were those of tuberculosis as released by Chief Health Officer, Dr. P. S. Campbell, showing a death rate of 85.1 per 100,000 for 1937 (the last year for which vital statistics are available) as compared with a rate of 90.3 for 1936. The maternal mortality rate for the same year was the lowest in Canada, the lowest ever recorded in Nova Scotia, a rate of 3 per thousand living births.

A 36-bed tuberculosis annex for the Glace Bay General Hospital seems assured with the approval of subscribers at their annual meeting recently. The building will cost $90,000 and will be operated on the same plan as the hospital, being financed by the citizens, largely miners, through their cooperative, "check-off" system. As with other hospitals operating under the same conditions, the annex will receive one dollar, per patient, per day, from the provincial government.

Reports from Kentville of the fifth annual health survey of school and high-school students reveal that this year there are practically no objectors to either tuberculin tests or general examinations.

Increase in the number of institutional mental cases by more than 200, to 2,683 for 1938, does not necessarily indicate an increase in mental disease in the province, according to Dr. P. S. Campbell, but rather points to the increased use of the institutions by the people.

The danger of typhoid in Yarmouth from contamination of the town water supply was pointed out to town councillors by Dr. J. S. Robertson, Divisional Health Officer. Dr. Robertson's report of the discovery of seven new cases of tuberculosis since the opening of the Yarmouth clinic prompted the appointment of a committee to approach the provincial government with a view to erecting a tuberculosis annex in connection with the local hospital, a project under consideration for some time.

Upholding the reputation of the medical profession for attainments in other fields of endeavour, Dr. A. S. Burns, of Kentville, medical practitioner for 33 years, has accepted a call to the pastorate of the Port Hilford group of Baptist churches in Guysborough County. Since being licensed to preach a year ago, Dr. Burns has been conducting services, and his decision to devote his life entirely to the church was a well meditated one.

The appointment of Dr. M. J. Carney, Halifax, to the Provincial Medical Board has been announced in the *Royal Gazette*.

Sir John Boyd Orr, making a tour of Canada under the auspices of the Canadian Medical Association, delivered his first address on "Nutrition and Health" at Halifax before a large and appreciative audience. Local arrangements for the meeting were carried out by Dr. Gordon Wiswell, of the committee on nutrition of the Canadian Medical Association.

Seventy-two children and adults of Hebron received their first inoculation of diphtheria toxoid at the clinic conducted by Dr. Eldon Eagles.

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Six hundred and eighteen patients were treated at the Nova Scotia Sanatorium during 1938, according to the report of the superintendent, Dr. A. F. Miller.

ARTHUR L. MURPHY

Ontario

On March 21st, 22nd and 23rd, Dr. O. A. Bessey, of Harvard University Medical School, lectured at McMaster University under the joint sponsorship of the Hamilton Academy of Medicine and McMaster University. He gave a course of five lectures on the subject "Nutrition and the vitamins".

The staff of the new Ontario Hospital at St. Thomas are taking up their new quarters in the hospital preparatory to the reception of patients during the month of April.

The new wing of the Tillsonburg Soldiers' Memorial Hospital was officially opened on March 8th. It is hoped that this new addition will alleviate the serious overcrowding which has been prevalent for the last three years. Another wing is contemplated.

The Catholic Hospital Association met in Windsor during the week of March 23rd.

Drs. W. G. Cosbie, Toronto, and W. P. Tew, London, Members of the Royal College of Obstetricians and Gynæcologists, have been elected to the Fellowship.

The following promotions and retirements in the R.C.A.M.C. have been recently promulgated: Lt.-Col. L. J. Austin, E.D., is transferred to the Reserve. Lt.-Col. F. S. Park, O.B.E., V.D., is transferred to the Reserve. Promoted Major: Capts. J. Boyd, T. G. Heaton, A. B. James, H. W. B. Locke, R. J. W. Brooke, S. E. Grimes. Promoted Captain: Lt. J. W. Brennan, Lt. G. E. Hall.

The Department of Health of the Province of Ontario has announced to the physicians of the province that it is prepared to supply old tuberculin free of charge for the purpose of the intracutaneous tuberculin test. The dosage recommended is 1/20 mg. All reactors are advised to have a complete physical examination. An x-ray of the lungs seems desirable, to exclude pulmonary tuberculosis. If children react to the tuberculin the physician is asked to search for the source of infection in the home.

The Hamilton *Spectator* of March 14th published an interview with Dr. J. H. Holbrook of the Mountain Sanatorium in which he stressed the vital part played by occupational therapy in the treatment of patients at the Sanatorium. This form of treatment at the Sanatorium has expanded until now with seven hundred patients in residence, there is a staff of five occupational therapists, four educational therapists, and a part-time teacher who gives a course in commercial work for young men who hope to return to this work.

Two important events scheduled for the month of May are the arrival of their Majesties, the King and Queen, and the annual meeting of the Ontario Medical Association. It was hoped that the time of their Majesties' visit would coincide with the week of the Annual Meeting (May 29th to June 2nd), but as the authorities have made other arrangements, we will not have the opportunity to pay our loyal respects as an Association. The gathering will nevertheless be noteworthy because our hosts, the members of the Hamilton Academy of Medicine, have spared no effort to ensure that everyone will enjoy the hospitality which characterizes meetings in Hamilton. A perusal of the preliminary program which has been distributed will convince every member that the scientific papers have features of interest for all. The topics are practical and up-to-date, and the speakers have been carefully selected for their ability to present their subjects. The scientific and commercial exhibits will be seen in full flower, and these displays will again prove attractive features of the meeting. Altogether, we are looking forward to a most enjoyable and profitable visit to Hamilton in May.

Dr. Edward A. Strecker, Professor of Psychiatry, University of Pennsylvania, will give a lecture in Convocation Hall, University of Toronto, at 8 p.m., May 5th, under the auspices of the Toronto Academy of Medicine. His subject will be "Beyond the clinical frontiers—a study of some of the relations and applications of psychiatry to everyday life".

The Salmon Lectures were established in 1931. Since that date outstanding psychiatrists have given a series of three lectures each year at the New York Academy of Medicine.

This is the first occasion for the delivery of a Salmon Lecture in Canada, and the Toronto Lecture will be a condensation of the three addresses Dr. Strecker will have given in New York.

J. H. ELLIOTT

Quebec

A Bill to incorporate Quebec province's chiropractic association was killed on March 23rd by the Private Bills Committee of the Legislature.

The St. Mary's Hospital, Montreal, has been campaigning for $500,000 to enable it to provide 50 per cent more accommodation for public patients.

On April 11th, Sir John Boyd Orr, of Aberdeen, Scotland, addressed a large audience at the Ritz-Carlton Hotel, Montreal, on "Diet and nutrition", under the auspices of the Canadian Medical Association.

The lecturer addressed himself chiefly to the lay public, and outlined in simple terms the scientific work which led to the discovery of vitamins. He then referred to the various troubles resulting from the lack of vitamins—the so-called "deficiency diseases".

Many illnesses were attributable to malnutrition in modern life. Scurvy and anæmia and fragility of bones in aged persons, and many other disorders afflicted a large proportion of city dwellers without their knowledge, and led to many other illnesses which would never have arisen if the general dietary habits had been correct.

The 19th century had been remarkable in medical progress by virtue of discoveries made in the bacteriological field. The present, the lecturer hoped, would become famous because of the wider knowledge of the manner in which diet affected the individual and either predisposed him to illness or made him fit.

"During the past century we have added about 20 years to the average life expectancy of the individual," he said. "I am certain that we have added at least seven years to the life expectancy of the average Briton in the years since the War, through a better knowledge of diet." But there still was much to be done before diets in Britain were really such as were required.

"Incidentally", Sir John said, "If all children and adults drank as much milk as is recommended, this would have a profound effect on agriculture in Britain and also in Canada. In the first place, it would be necessary to have 2,500,000 more cows in Britain. In the second they would probably be able to take all the cheese and butter that we could export. In the third place, if Canada actually had an ideal diet, its surplus of dairy products would probably be very much reduced."

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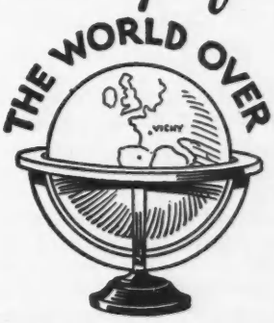

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Sir John ended with an appeal for a wider spread of dietary knowledge in all homes, pointing out that a child's most important period, from a dietary point of view, is before it is born, and the first five years of home life. "Feeding children with milk and cod liver oil in schools is an aid, but definitely comes too late."

The Quebec Society of Occupational Therapy met in the Willingdon Room, Central Y.M.C.A., Montreal, on April 20th. Dr. W. J. Patterson spoke on "Some phases of occupational therapy in institutions dealing with the mentally and physically handicapped".

United States

The American Association of Obstetricians, Gynæcologists and Abdominal Surgeons announces that the annual Foundation Prize for this year will be $100. Those eligible include only (1) interns, residents, or graduate students in obstetrics, gynæcology and abdominal surgery, and (2) physicians (M.D. degree) who are actually practising or teaching obstetrics, gynæcology or abdominal surgery. Competing manuscripts must (1) be presented in triplicate under a nom-de-plume to the Secretary of the Association before June 1st; (2) be limited to 5,000 words and such illustrations as are necessary for a clear exposition of the thesis, and (3) by typewritten (double-spaced) on one side of the sheet, with ample margins. The successful thesis must be presented at the next annual (September) meeting of the Association, without expense to the Association and in conformity with its regulations. For further details, address Dr. James R. Bloss, Secretary, 418 - 11th Street, Huntingdon, W. Va.

The American Congress on Obstetrics and Gynæcology.—The attention of members is called to the convention which is to be held at Cleveland, O., on September 11 to 15, 1939. The fee for registration is $5.00. For further information address the Central Office, 650 Rush Street, Chicago, Illinois.

General

The Third International Neurological Congress.—This Congress will be held in Copenhagen, Denmark, from August 21 to 25, 1939. In accordance with the usual custom four days will be devoted to the scientific sessions of the congress. Three symposia will be held. A morning and an afternoon session will be devoted to the consideration of each of these topics, one day being devoted to each subject. The following subjects will constitute the symposia: (1) The autonomic nervous system, with special reference to the endocrine system. (2) Heredofamilial disease, especially from the genetic aspect. (3) Neurological aspects of the avitaminoses, with special reference to the peripheral nervous system.

Dr. Wilder Penfield, of Montreal, is Canadian Vice-president of the Congress.

The sessions of the Congress will be held in the Houses of Parliament in Copenhagen. One day of the Congress will be devoted to the presentation of short papers by active members of the congress.

As no title or abstract will be accepted by the Danish Program Committee unless at that time the author is an active member of the Congress, Canadians interested in attending the Congress should communicate as soon as possible with Dr. Donald McEachern, Montreal Neurological Institute, 3801 University Street, Montreal, Que.

Book Reviews

The Abnormal in Obstetrics. Sir Comyns Berkeley and D. MacLeod. 525 pp. $5.50. Macmillan, Toronto, 1938.

This book is interesting and unusual in that it is not a textbook of obstetrics, but rather a supplementary volume. It is a collection of valuable bits of information, chiefly culled from the extensive experience of the authors, on every possible abnormality to be found in pregnancy and in the new-born child. The preface explains its object. "In this work we present obstetrical abnormalities in a wider manner and have largely omitted those details of anatomy, physiology and operative procedure which are already so fully set forth in such textbooks." The authors are undoubtedly up-to-date in viewpoint. They advocate and describe the use of sulphanilamide in the pyelitis of pregnancy and in puerperal sepsis. As a local antiseptic, dettol is frequently advised, also flavine, which is rarely if ever employed in this country. The advantages of the lower uterine Cæsarean section over the classical type are emphasized. They recognize and adopt the outstanding work of Caldwell and Moloy in the classification of pelves. In Canada we tend to think of the English as conservative in their attitude to medical problems. It is therefore, rather unexpected to find the authors advising the use of the blunt hook for the delivery of frank breech presentations; symphysiotomy and pubiotomy in certain contracted pelves; and "the immediate emptying of the uterus by operative means in septic abortion". There is an interesting and instructive chapter on mental disorders in relation to child-bearing by Sir Hubert Bond, K.B.E., Senior Commissioner, Control Board of Lunacy and Mental Deficiency, and a detailed chapter on blood transfusion and non-oral administration of fluids by Drs. Marriott and Kekwick. About fifty pages are devoted to the Diseases of the New-born. Undoubtedly this book should be in every medical library.

Everyday Surgery. L. Rogers and A. L. d'Abreu. 280 pp., illust. $3.75. Macmillan, Toronto, 1938.

This is a small handbook designed to supply the need of practitioners to whom a ready reference is often invaluable. The commonplace conditions of surgery, their diagnosis and treatment, are considered concisely and dogmatically. Special branches and details of complicated surgical operations are omitted, the space being given to the presentation of methods advised by the authors for the management of surgical conditions which occur in everyday general or surgical practice. There are no lists of causes or varieties of diseases, the emphasis being laid on diagnosis and treatment. Minor surgery is given much space. The book, of course, will not teach anyone the whole of the art of surgery. It is, as the authors frankly state, a guide in emergency or in isolation, a remembrancer in times of special stress and trouble. All systems are treated in order and nowhere is one permitted to lose sight of the general rules of surgery, nor to forget that any disease must be considered in its relationship to the body as a whole. Throughout the text free use has been made of diagrams to illustrate the anatomy of the parts and the steps of operative procedures. However, the striking features of the work are the clear, definite instructions given for the treatment of each condition, and the impression the reader has is that the procedure laid down is the tried method of the authors.

BOOKS RECEIVED

Handbook of Sanitary Law. B. B. Ham. 12th ed., 355 pp. 7s. 6d. H. K. Lewis, London, 1938.

Lewis's Medical and Scientific Library. Part I, Authors and Titles. New edition to end of 1937. 550 pp. 16s. H. K. Lewis, London, 1938.